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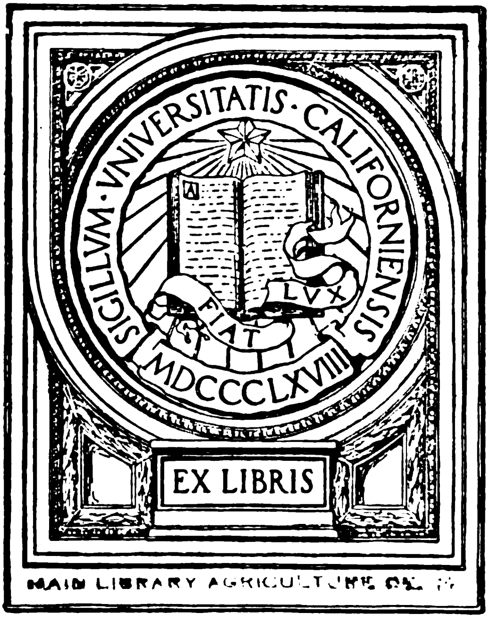

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THE

FORCING, FRUIT,

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UNIV. OF CALIFORNIA

THE
FORCING, FRUIT, AND KITCHEN GARDENER:

COMPREHENDING THE FORCING OF

ASPARAGUS,
CUCUMBERS,
CHERRIES,
FIGS,
GRAPES,
MELONS,
MUSHROOMS,
NECTARINES,
PEACHES,
PINE APPLES,
AND
STRAWBERRIES.

TOGETHER WITH THE

Management of the GREEN-HOUSE—Culture of WALL and ORCHARD FRUITS—KITCHEN VEGETABLES, SALLADS and HERBS.

THIRD EDITION, WITH LARGE ADDITIONS.

Illuſtrated with SIX NEW COPPERPLATES;

CONTAINING TEN DIFFERENT DESIGNS OF HOT-HOUSES, HOT-WALLS, &c.
ON THE NEWEST AND MOST IMPROVED CONSTRUCTIONS.

BY WALTER NICOL,

Author of "THE PRACTICAL PLANTER," and of an "ESSAY ON GARDENING," drawn up by Deſire, and for Conſideration of the Board of Agriculture; and Correſponding Member of the Natural Hiſtory Society of Edinburgh.

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THE AUTHOR of the following Work, gives Deſigns for Gardens, Hot-Houſes, Shrubbries, Plantations, Parks, Approaches, &c. in the neweſt Taſte. Alſo, gives advice and examples for Thinning and Pruning neglected Plantations, in every ſtage of their growth; with proper memoranda reſpecting their future Culture.

⁂ Letters addreſſed to W. NICOL, Planner, &c. Leith-Walk, Edinburgh, will be duly attended to.

PRE-

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PREFACE

TO THE THIRD EDITION.

SINCE the publication of the Second Edition of this Work, in March 1798, many important Diſcoveries have been made in Gardening. The Author, in a pretty extenſive practice, as a Deſigner of Gardens, Hot-Houſes, &c., has had an opportunity of minutely obſerving, and has carefully attended to, every valuable improvement; whether in the conſtruction of Hot-Houſes, &c., or in the Culture of the different Plants treated of. He therefore ſubmits this Edition to the Public, enlarged and greatly improved; with the hope that it will, like the two former, be favourably received.

Leith-Walk,
Feb. 10. 1802.

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BOOK FIRST.

THE
FORCING GARDENER.

INTRODUCTION.

THIS branch of Gardening certainly ſavours more of luxury than any other; at the ſame time it muſt be allowed to be a moſt rational amuſement, profit and pleaſure being in ſome meaſure blended together.

Hereby, not only the moſt rare European plants, but alſo thoſe of Africa, Aſia, and America, are cultivated and brought to very conſiderable perfection, and to the intimate acquaintance of the Botaniſt, who, otherwiſe, would be obliged to place implicit confidence in the authors of diſtant countries, or take expenſive voyages to enable him fully to purſue his ſtudies.

Hereby, alſo, the fineſt fruits of France, Spain, Italy, Perſia, and the Weſt Indies, are cultivated and brought to early perfection in our Northern Clime, which, otherwiſe, would only be known by name.

What are reckoned luxuries when firſt introduced, are by uſe converted into neceſſaries. Witneſs coffee, tea, ſugar, &c. which, although lately introduced, were they prohibited, would not only be miſſed, but even longed for by the loweſt claſſes of the community.

May not the wealthy eat a melon, peach, bunch of grapes, or pine-apple, with as much propriety as drink a bottle of port, claret, champaign, or madeira? Are theſe not, if well ripened, equally wholeſome? Have they not the moſt rational amuſement in the production of them? And does it not, to the contemplative mind, afford a ſource of real pleaſure? We are certainly juſtified in thinking ſo, by recollection of the many extenſive additions and improvements which have lately taken place in this elegant branch of horticulture.

Nevertheleſs, there is ſtill ample room for improvement, which, in a ſcience ſo complicated, muſt neceſſarily happen for a conſiderable length of time after introduction. It is even probable, that this branch, in reſpect of improvement, is but in a ſtate of infancy. And this ſuppoſition ariſes, by conſidering the *many* opinions and ideas entertained by profeſſional men on this ſubject; for until *thoſe* of *any* ſcience are agreed, reſpecting points of the firſt conſequence, perfection cannot be ſuppoſed near.

A ſettled plan of conſtructing hot-houſes, &c. is by no means yet fixed, moſt gardeners and hot-houſe builders differing in ſome point or other. This is an article of importance, and there are extremes which ſhould be avoided. But it would appear, that the failure of ſucceſs in this ſpecies of horticulture is leſs in conſequence of improper conſtruction of the houſe, than in the preparation of proper ſoil, and the general management; ſince in ſome inſtances we find excellent crops produced in houſes very indifferently conſtructed; and in others, very indifferent crops, in houſes well conſtructed.

Situation is alſo a material point. Every hot-houſe ſhould be placed, if not in a ſheltered, at leaſt in a dry one, or which is capable of being rendered ſo, by draining.

It is alſo of importance to have a perfect command of fire-heat. For this purpoſe, reſpect muſt be had to proportioning the *content* of the houſe, to the power of the furnace or furnaces, and that, too, according to the purpoſe for which it is appropriated, as whether it be a Pinery, Vinery, or Peach-houſe, and if either of the latter, whether it be intended for early or late forcing.

But there are thoſe who lay more than ſufficient ſtreſs on this ſubject: Thinking, perhaps, to demonſtrate, that by building a capacious houſe, with a furnace leſs than another would adviſe, or which in the end is found neceſſary, how great a ſaving there might be of fuel.

Of this, however, experience has convinced me, that by allotting ſpace which a furnace cannot *well* command, inſtead of being a ſaving, is a great waſte of fuel. Nor will the gardener ever have ſucceſs, but with much difficulty.

For inſtance, if a furnace ſhall be placed at one end of a capacious houſe, which with difficulty can be raiſed to the degree required on a ſcale hung in the middle, will not the end of the houſe whereat the furnace is placed, be over-heated? and will the other end ever riſe to the degree required, before all other parts of the houſe be over-heated? Is not this both a waſte of fuel, and a thwarting of intention?

And what ſaving is there in the firſt onſet? or rather, what *waſte* is there by *rending* the furnace and flue with immoderate heat? Is there an inch of flue *leſs*? —There is, to be ſure, a grate and furnace *more*, which may coſt ſome forty or fifty ſhillings; but which will, in one ſeaſon, be repaid by the ſaving in fuel. Nor will either flue or furnace require any repair for many years afterwards.

But, laying all conſideration of expence aſide, if it is found that a hot-houſe may be more ſteadily worked with two furnaces than with one, Why not erect two? Does the trifling ſum of a few ſhillings in any meaſure weigh with the inſurance of ſucceſs, in the production of good crops?

I do not here preſume, that for *every* hot-houſe, there are to be two furnaces erected. I would be underſtood, as ſpeaking of *large* houſes, that is, grape and pine houſes above forty feet in length, and peach houſes above fifty, &c. But for a full explanation of my ideas on this ſubject, I beg to refer the reader to the accompanying plates, and their explanations.

Forcing, that is, producing flowers and fruits in hot-houſes at an untimely ſeaſon, is attended with more or leſs ſucceſs, according to the nearneſs we approach nature in the proceſs.

Hence the neceſſity of introducing the impoſed climate, as it were by ſtealth, admitting air freely, unleſs of an impure nature, and making artificial dews and ſhowers to nouriſh and refreſh, not only the root, but alſo the foliage:

Alſo, as the plants are forced out of their natural inclinations in a great meaſure, do not perſpire ſo copiouſly, nor have an opportunity of imbibing nutritive matter from the natural atmoſphere in ſuch quantity as if they were growing in the open air, of compoſing a richer and deeper body of ſoil, for the ſupport of vegetable life, than otherwiſe might be required.

In the cultivation of exotic plants and fruits in hot-houſes, regard muſt be had to the climate of their nativity; and the beſt endeavours ſhould be uſed to imitate it in the hot-houſe; introducing the natural changes of the ſeaſons with equal care.

This, however, is done with conſiderable difficulty, as may be conceived, by conſidering the difference of latitude, and the variation of the ſun's altitude throughout the ſeaſon, which is greater as we approach the pole.

Hence the difference of trouble attending early and late forcing. And hence, alſo, the difference of injury done the plants in the operation; and, that they may ſuſtain the leſs, the neceſſity of a more moderate treatment in the one than the other. The one is *ſtriving*, the other *ſtriving hard* againſt the ſtream.

Sudden checks of any kind are to be avoided, particularly while the bloom or fruit is in a tender and infant ſtate, otherwiſe diſappointments may be apprehended. This is to be more particularly attended to in the forcing of *ſtone*, than other fruits; theſe being more impatient of ſudden changes in the climate, particularly while *ſetting* and *ſtoning*.

For the production of fruits in a high ſtate of flavour and perfection, a large and free circulation of freſh air, as they approach maturity, is eſſential. Alſo denying, in a great meaſure, the quantity of water the plants may ſeem to crave, that the fruit be not rendered inſipid by the plants imbibing too much of that element; which, however, at all other times, ſhould be freely beſtowed according to the nature of the plant in queſtion.

Finally, forcing of any kind being an outrage done nature, the more we avoid it the greater will be our ſucceſs. She ſhould be kindly aſſiſted, nor ſpurred, nor thwarted, when it can be avoided.

Hence the neceſſity of the niceſt obſervation in diſcovering the natural inclinations of the different plants, which ſhould be kindly treated and encouraged, on all occaſions.

THE

FORCING GARDENER.

CHAPTER I.

ASPARAGUS.

THIS delicious and wholeſome vegetable being required in moſt families at an early ſeaſon, the forcing of it is pretty generally underſtood; yet, for the ſake of thoſe who may not have had an opportunity of ſeeing the common methods practiſed, and on account of ſome ſucceſsful experiments, made in this branch of forcing, I hope what I have to advance on the ſubject will be acceptable and uſeful to my readers.

WHERE there is not the conveniency of a forcing pit, (See Plate I. Fig. 1.) a frame and lights, ſuch as is uſed for melons, muſt be employed: but I have found by experience, that a flued pit is much to be preferred; as in it the graſs may be produced of a much better colour, and higher flavour, than on a dung hot-bed.

It frequently occurs, particularly in large families, and where much company is kept, that the gardener is put to a nonplus, by not being timouſly adviſed that ſuch articles are wanted. The conveniency of having a pit, will be found a great relief in this reſpect; as it is much eaſier, by aid of the flues, to forward or protract the growth of the plants here, than in a common hot-bed: on the one hand, if the plants are advancing too rapidly, there is a neceſſity for cooling the bed in a certain degree; and, on the other, if they are not advancing ſo faſt as could be wiſhed, the application of linings becomes neceſſary, which is attended with much trouble and loſs of time.

A pit, twenty-five or thirty feet long, and ſix wide, and which one fire can perfectly command, is ſufficient to force Aſparagus to ſerve a large family from November to May, in a conſtant and regular ſucceſſion: after which, it may be advantageouſly employed in raiſing a late crop of melons or cucumbers, or in ſtriking young pine-apple plants, &c.——But, as many may not have the conveniency of a pit, I ſhall firſt treat of the method of forcing Aſparagus on a dung hot-bed, and then in flued pits, according to my mode of practice.

Firſt, let it be preſumed, that a good ſtock of roots, not younger than four years, nor older than ſeven or eight, are provided; which, by being covered with litter, &c. acceſs may be had to, in caſe of froſt, at any time; and alſo, that it is required Aſparagus may be on the table againſt a certain day, ſuppoſe the 1ſt of December *.

About the 1ſt of November, let a ſufficient quantity of *ſtable-dung* be thrown together to heat and ſweeten; for a three light box; and after it has lain ſix or eight days, let it be turned over, and ſhaken well up a ſecond time; in which ſtate let it lie four or five days more. A moderate degree of heat is required, and conſequently the dung ſhould be carefully fermented, by turning the outſides or littery parts of the heap into the middle, one, two, or three times, at intervals of a few days each, as circumſtances ſhall direct.

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* It may be new to ſome, that, by cutting over all the ſtalks of Aſparagus, about the end of May, or beginning of June, it will put forth fine graſs in Autumn; which, if the ſeaſon happens to be fine, will continue till the middle or latter end of November. This is the reaſon I have fixed on the 1ſt of December for forced Aſparagus, being required as above: but I do not mean this to be conſidered as a rule. Sometimes

When the dung is judged to be in a proper condition, proceed to build the bed. This muſt be done, in the common way, to the height of four feet in the back, and three in front, and about a foot larger than the frame all round. Level it well; and cover the whole with ſquares of turf, cut ſo as to join again exactly; which lay green ſide down, and ſmooth with the back of the ſpade.

Sometimes it may be required much ſooner, and ſometimes not till Chriſtmas.—I beg to obſerve here, that, where there is a great ſtock of Aſparagus, it is a good way to cut over a *part* in May or June, to come in in Autumn: but let not the gardener expect any more good from the graſs ſo cut, *as ſome pretend*;—it is a ſpecies of forcing, and conſequently muſt exhauſt nature.

ſpade. By aid of turfs carefully placed in this manner, a rank ſteam is effectually prevented, which is of no ſmall importance in the forcing of Aſparagus; the ſteam ariſing from rank dung of this deſcription, not only diſcolouring the graſs, but tainting its flavour. Place on the frame: It ſhould be thirty inches deep in the back, and twenty in front: Let dry, well-reduced old tan, to the thickneſs of ſix or eight inches be laid in it; which level and ſmooth with the ſpade.

The roots being ready, (which ſhould be taken up with great care), proceed to lay them, crowns up, as cloſe as they will lie together; endeavouring to keep them as level as poſſible, and diveſting them of all the old hulm and rotten roots. Cover the whole with old tan as above, to the thickneſs of three inches; and put on the lights.

The bed will begin to *heat* in twenty-four hours; and muſt then have air admitted, to paſs off any ſteam that may riſe, which will, however, be inconſiderable, I preſume. Indeed, the only cauſe for turfing the ſurface is to prevent ſteam; which, if carefully done, will have the deſired effect;

fect; yet, it ſometimes happens that a little will riſe, eſpecially if the dung did not undergo a proper fermentation: but, until the graſs begin to appear, it is not material if there is a little ſteam in the frame; nor, provided there is not much ſteam, whether it has any air admitted or not. But, from the moment the buds begin to appear, the greateſt attention muſt be paid to prevent, or to draw off the ſteam; which is ſure to give the graſs a very diſagreeable flavour and bad colour.

In order to prevent the graſs from drawing up weakly, a large portion of air muſt be admitted every day, if the weather be not ſtormy; and a little air ſhould alſo be left at night, while a rank heat prevails in the bed. Fahrenheit's thermometer ſhould not ſtand above 50° at any time, unleſs in ſun-ſhine, and even then, not above 60°. By this rule, it will be ſeen whether matting at night is neceſſary, and to what extent; therefore, it may be unneceſſary to ſay more on that head: but the article *ſteam* muſt be farther conſidered, and indeed kept in view till it is entirely ſuppreſſed. If, then, by leaving a little air at each *light* in the night, does not completely draw off the ſteam and damp, recourſe muſt be had to *boring* the bed; which is done by thruſting a large ſtick ſuch as the handle of a pitch-fork, &c. into the ſides and ends, in ſix or eight places, leſs or more, according to the heat of the bed. The holes ought to be kept open, by probing them every day, ſo long as any ſteam remains; and then ſhould be cloſed, to prevent it from cooling too much.

I have ſeldom found it neceſſary to *line* Aſparagus beds; yet ſometimes, in ſtormy weather, it is requiſite. This ſhould be done with caution; and never more than one ſide of the bed ſhould be lined at a time. Let the dung for this purpoſe be prepared in the ſame manner as for the bed, at firſt; then cut, with a ſharp ſpade or dung-knife, the part to be lined, perpendicularly by the ſide of the frame: reject the tan and turf, and the reſt may be uſed along with the new dung, unleſs very much waſted. From twenty-four to thirty inches will be a ſufficient breadth for the lining; raiſing it to about ſix inches above the bottom of the frame, obſerving to tread it well towards the old dung, and to give it a conſiderable ſlope on the outſide, which naturally makes it lean that way.

If the lining ſhould raiſe too great a heat in the bed, or cauſe any ſteam, it muſt be drawn off, as directed above; and, when it has done ſubſiding, let it be turfed in the ſame manner the bed was at firſt.

Water has not yet been ſpoken of; and I can truly, though frivolouſly, aſſert, that I have frequently produced a whole crop of Aſparagus without "either earth or water." This, however, is not always the caſe, nor is it deſirable; as, if a little water is not required, the dung muſt be in too moiſt a ſtate, and conſequently, too much noxious vapour muſt have attended the whole proceſs. It will be adviſable, however, to be ſparing in the uſe of that element; as, at this ſeaſon of the year, and in this country, we have but too much cauſe to lament the abſence of that luminary which is the very eſſence of vegetation.

When the buds have advanced to the height of three inches above the ſurface, they are then fit to be cut, as, by that time, they will be ſix inches in length: and this operation muſt be performed with great care, as the buds will be found to riſe very thick. The tan being of a looſe nature, there is no difficulty in thruſting down the finger and thumb to the crown of the root; and, as forced roots are of no uſe afterwards, I prefer twiſting off the bud to cutting it, leſt the others that are riſing be injured.

A three-light frame (which is generally ten or twelve feet long, and five or ſix broad) will contain a number of roots; and, after it is fairly begun to produce, will yield an ordinary diſh every day, for fifteen or twenty days. If, therefore, a ſucceſſion of graſs is required, it will be neceſſary to make up a ſecond bed about eight or ten days after the firſt, and a third about three weeks after the ſecond; which laſt time will be a good medium for each ſucceſſive bed: but of this, the operator will be the beſt judge; as much depends on the ſtrength and quality of the roots, and on the conſumpt of the family.

In many places, it is probable, there may not be ſuch a thing as old tan: as a ſubſtitute,

ſtitute, I would recommend light, ſandy, mixed with a fourth part of vegetable, mould. Indeed I am convinced, that entire vegetable mould produced from decayed tree leaves, would be the beſt for forcing Aſparagus in: but this I do not know from practice; as I have ever found *that article* too precious an ingredient for more valuable purpoſes, to laviſh it on the forcing of Aſparagus. But, to wave this conſideration, I do not think it is very material in what kind of mould Aſparagus be forced, provided it be light enough; as I am convinced, from long obſervation, that the roots draw little nouriſhment from the mould, a ſmall degree of moiſture being all that is neceſſary to the production of their buds, after which the roots periſh. My only reaſon for uſing old tan was, the ſcarcity of light, or vegetable mould, and the plenty of the former (otherwiſe almoſt uſeleſs) article. But this much I can affirm, that, by the uſe of tan, the graſs may be produced five or ſix days ſooner, in as high perfection, and with a better colour, (provided it be uſed perfectly dry,) than with mould of any kind.

I come now to the forcing of Aſparagus in flued pits; which, in my opinion, is the moſt eligible method. I would not wiſh to infer from this, that any gentleman ought to be at the expence of erecting a pit ſolely for the forcing of this article. A pit, ſuch as is repreſented by Fig. 1. Plate I. will completely anſwer this, and many other purpoſes: and the trifling conſumpt of fuel, even where that article is moſt valuable, ſhould not deter any, who are lovers of gardening, have fine gardens and hot-houſes, and require Aſparagus, French beans, ſallads, &c. at an early ſeaſon, from building ſo uſeful a compartment in the forcing garden. Farther, if a ſcrupulous attention is paid to the deſign in general, particularly to the conſtruction of the fire-place and flues, I can with confidence preſume, that it will give more ſatisfaction to the gardener than any hot-bed whatever, and in the end will be found a ſaving to the proprietor *.

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* In the conſtruction of this pit, as will be ſeen by the plate, the firſt courſe of the flue runs along the front, the bottom of which is about the ground-level; and, as

The pit (ſee the plan) is about four feet in the back, and three in front, deeper than the bottom of the flues: which great depth is made on the preſumption that it may be frequently uſed in raiſing of pine-apple plants; but, were it intended for Aſparagus alone, half this depth would be ſufficient.

It is immaterial whether the pit be entirely filled with tan or not: I have frequently uſed three-fourths ſtable-dung, prepared in the ſame manner as for a hot-bed, with equal ſucceſs: but have always found that the dung is more difficult to manage than the tan, being liable to heat violently: beſides, from the nature of the building,

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the outer wall of the flue is only a brick on bed, it is obvious, that early celery, carrots, lettuce, radiſh, cauliflower, &c. &c. ſown on a well-prepared border about two feet broad, immediately adjoining the breaſt of the pit, would reap infinite advantage from the flue. At the time of any operation within the pit, a broad plank, ſupported by bricks, &c. would defend the crop on the border from injury. This hint is not from ſpeculation; I have practiſed it for many years; and would ſeriouſly adviſe every gardener to do ſo on all occaſions, where it will anſwer. I have always found the plants ſo raiſed, to be preferable to thoſe raiſed on hot-beds.

ing, there is no poſſibility of drawing off the rank heat, as in a hot-bed: for which reaſon, if dung alone is to be uſed, it ought to be more carefully fermented.

A ſmall degree of bottom heat is ſufficient for the purpoſe; and, if the pit has been previouſly employed in the culture of young pines, it will require no preparation whatever for the reception of the Aſparagus roots, excepting to level and put a few inches of well-reduced tan on the ſurface. But, if melons were the laſt article produced in the pit, it will be neceſſary to trench the bed about two feet deep, and add a little new tan or dung; then level the ſurface with old rotten tan, as before. In either caſe, let the ſurface be levelled in a ſloping manner, to the ſun, and about ſix inches above the bottom of the flues, allowing for the tan ſettling ſo much; then let the roots be placed and covered, as directed for the common hot-bed.

If the pit is from twenty to thirty feet long, one half will be ſufficient to be filled at a time; and, to keep a conſtant ſucceſſion of graſs, fill the other half with roots in fifteen or twenty days, which will begin to produce before the firſt is all uſed; after which, once a month or ſix weeks, according to the ſize of the pit and conſumpt of the family, will be ſufficient, till graſs be fit for cutting in the open ground.

Make no fires, if the thermometer ſtand ſo high as from 48° to 50°; and, if neceſſary, cover with mats at night; alſo, admit air freely through the day, if the weather will permit. When it is neceſſary to make fires, let it be done with caution: A ſmall fire made in the evening will generally ſerve the whole night; and it will be unneceſſary to make any fires in the morning, unleſs the weather be ſtormy. I have ſometimes, however, found it convenient to make a ſmall fire in the morning, that I might have it in my power to admit air, and at the ſame time keep up a proper degree of heat.

Water will be required in a more plentiful degree than has been recommended for the hot-bed, as the fire heat will abſorb the moiſture conſiderably. Let a due obſervation of the ſtate of the tan, the health of the buds, and the diſcretion of the gardener, always determine this matter.

In filling the firſt end of the pit *a ſecond time* with freſh roots, it will be unneceſſary to ſtir up the tan, &c. and perhaps may be ſo, even the third filling; but, by keeping a thermometer plunged in the bed, or watch-ſticks, this matter may be determined. At all events, there will not be a neceſſity of adding freſh materials. I have generally found, that trenching the bed to the depth of two feet, or ſo, has anſwered the purpoſe for the whole ſeaſon.

If dung alone, or oak-leaves are uſed, let the bed be turfed, and at leaſt a foot of very rotten tan or light mould be laid on, before the roots are placed.—This precaution is unneceſſary when tan *only* is uſed; in which caſe, however, not more than an eighth part of *new* tan ſhould be trenched in.

CHAPTER II.

CUCUMBERS.

THIS fruit is in ſuch eſtimation, particularly about London, that the *early* production of it has become an object of contention amongſt gardeners; which has given riſe to many experiments for the attainment of their object, viz. to have cucumbers on the table in the months of January and February.

Various are the methods that have been practiſed in other parts of the country, for attainment of this matter; and a few have been ſucceſsful, in one or two inſtances: but, the trouble and expence attending the operation, has generally been found inadequate to the ſatisfaction of the purſuers of this truly trivial object.

The objections to the *old-faſhioned* method of forcing Cucumbers and melons on hot-beds compoſed entirely of dung, are, that the plants are apt to be burnt with too violent a heat, and blanched with the rank ſteam wherewith theſe beds abound.— Theſe objections, I confeſs, are weighty; and, I believe, but too well-founded in general. But, I have the happineſs to ſay, that I have forced Cucumbers and melons many years, and, twice excepted, have never had my plants injured in the ſmalleſt degree by too violent a heat, or too rank a ſteam; and, if my mode of practice, which I ſhall endeavour to explain below, is followed, I preſume it will be found to be the leaſt perplexing, the leaſt expenſive, and perhaps the moſt productive, of any yet laid before the public.

It is a ſubject of regret *, that Mr MacPhial's method has failed of the deſired ſucceſs. Nevertheleſs, I believe not many gardeners regret it much; for (the object of trouble aſide) it evidently tends to empoveriſh the kitchen-garden, by depriving it, in a great meaſure, of its common and neceſſary reſource for manure.

Trials have been made to force theſe fruits on the old beds of the former year, by

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* For himſelf.

by the aid of new linings. This has alſo failed of ſucceſs; as it hath been found, that the old dung contains a more noxious damp than the new; and the frequent loſs of heat in the linings occaſions a conſtant perplexity. The ſame cauſe, too rank a heat and ſteam, gave riſe to the trial of this method as the former.

Late crops of Cucumbers and melons may be raiſed with ſucceſs in flued pits, (I ſpeak experimentally); but I have ever found that early ones may be much better produced on a dung hot-bed. The cauſe is obviouſly, that theſe plants delight in a mild, moiſt heat, and are impatient in a dry, fire heat. The latter, however, is of infinite ſervice late in the Autumn, by drying off the external damp, and haſtening the maturity of the late fruit.

Where tanner's bark is plenty, and the more valuable material, dung, is ſcarce; theſe fruits may be ſucceſsfully produced by compoſing the bed of bark, with as much dung or litter as will ſuffice to build the outſides; or by building retaining walls of brick, ſtone, turf, &c. and fitting the frame thereto: but care ought to be taken, that the roots of the plants, at no ſtage of their growth, touch the bark, which never fails to canker them.

It is a practice with many to *ſink* their hot-beds, or at leaſt partly; and this is generally done with too little diſcrimination. I am far from diſapproving the practice, provided it can be done with propriety, as, by doing ſo, a degree of neatneſs is given to that department of the garden: but this ought to be a ſecondary conſideration; for, if the ſituation is naturally damp, and if care is not taken to render it perfectly dry, diſappointments will doubtleſs attend the labours of the gardener.

It is cuſtomary to prepare ſeed-beds for Cucumbers about the middle of December, or firſt of January. The latter time I prefer, but moſt of all, the firſt of February; as I have often myſelf been, and frequently have ſeen others, put to more trouble and perplexity with a ſeed-bed at that early ſeaſon, than with the reſt of the framing for the whole ſeaſon afterwards, and all to no purpoſe: for experience ſhows, that plants * ſown about the firſt of February will ſucceed better, and produce fruit ſooner, than thoſe ſown at any period preceding.

Some raiſe ſeedling Cucumbers and melons in pine ſtoves, dry ſtoves, early-forcing houſes, &c. and tranſplant them into dung hot-beds. But, it muſt be confeſſed, they are not equal to thoſe raiſed in a ſeed-bed prepared for the purpoſe; as in the one they are but a ſecondary object, whereas in the other, they are the principal: beſides, there is a great diſparity of climate.

Cucumbers are often ſucceſsfully produced in boxes, placed in the pine ſtove, &c. at an early ſeaſon: but, as the heat of the ſtove is not regulated for their ſakes, it may be unneceſſary to ſay more on that head, than that they ſhould be placed in the moſt airy ſituation, ſhould be filled with rich light compoſt, and be duly refreſhed with water.

Having

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* I wiſh to be underſtood as ſpeaking generally;—there may be many exceptions: I alſo mean plants of the ſame ſort.

Having premiſed this much, I proceed to treat on the culture of the Cucumber on a dung hot-bed, ſuppoſing the plants being (or rather to be) ſown the 1ſt of February.

On, or about the 20th of January, let a ſufficient quantity of the very beſt mixed ſtable-dung be thrown together in a heap to ſweeten; let it lie for five or ſix days, and then turn it over, and ſhake it well up in a ſecond heap: in this condition, it may remain till the 1ſt of February, when it will be ready for building into a bed; which I ſhall ſuppoſe is for a one-light box of any convenient ſize.

If the dung is littery, dry, and *fiery*, it will be adviſable to pour on a quantity of water, in the proceſs of ſhaking up, or turning it. This will excite its fermentation, and reduce it ſooner into a proper ſtate; on which depends much of the future ſucceſs.

Proceed to build the bed; obſerving to keep it a foot larger than the box all round, and to the height of five feet in the back, and four in the front; obſerving to beat it well with the fork; and, if the dung is very littery, to tread it equally once or twice.

Some tread in all caſes, and others tread none in any caſe; but the propriety of treading the bed once or twice in the time of building, provided the dung be rank and littery, may not be diſputed; as, by treading, it is ſeen where the bed is *lean*, or otherwiſe. And that the whole ſettle equally, is of conſequence to the welfare of the plants, particularly in the *ridging-bed;* for, if the dung fall in holes, the mould will unavoidably crack, to the evident injury of the tender roots.

When at the proper height, let it be carefully *turfed* in the ſame manner as directed for the aſparagus bed: place on the frame; in which lay ſea or pit ſand of the fineſt quality, previouſly rendered perfectly dry, in a ſloping manner, correſponding with the *light*, and to within ſix inches of it: over this lay two inches of light ſandy loam: then, in a garden pot or pan, about ſix inches in diameter, being filled with entire vegetable mould * from decayed ed tree-leaves, ſow the ſeeds, and cover them with half an inch of the ſame: Plunge the pot or pan to the brim, in the centre of the bed the one way, and at a foot from the back, the other: Put on the light; and cover at night with a double mat.

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* The method of preparing this mould will be treated of in another part of this work.

The ſeeds ſhould be carefully guarded from mice, an animal too frequently found about hot-beds at this early ſeaſon, by placing a pot on that in which the ſeeds were ſown, whoſe brim or margin coincides with it, having a hole at bottom, too ſmall for admitting the enemy. This cover ſhould be removed in the morning, and replaced in the evening, until the ſeeds germinate, and the plants are an inch high. Theſe vermin commit their depredations chiefly in the night; and it is neceſſary that the plants enjoy the full ſun.

The bed will begin to heat in twenty-four hours, and muſt then have a little air admitted by tilting the back of the light an inch or ſo; and the front half as much *, in

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* This rule ought always to be obſerved, unleſs the ſeverity of froſty wind renders it hurtful to the plants.

in order to paſs off any noxious vapour that may have ariſen. Let the frame be matted every night at ſun-ſet, and uncovered by eight in the morning, or ſooner, if the ſtate of the weather will permit; and, from the moment the plants begin to appear, as due attention ought to be paid to this article as that of air and water. Every gardener has to lament, that, in this country, and at this ſeaſon of the year, our days are not only ſhort, but dull and hazy, to a degree that is but little known on the Continent; and it follows, that the leaſt neglect in admitting the rays of light, which is ſo neceſſary to the health and vigour of the plants, is, ſtrictly ſpeaking, unpardonable. Even the glaſſes ſhould be frequently waſhed, wiped, and at all times kept clean of duſt or litter, that the rays of light, or the ſun-beams, may not be obſtructed.

A little kindly ſteam in the morning is a good ſymptom; but this ſhould never be encouraged to any great extent: more than what entirely diſappears with the firſt hour after the frame has been uncovered, is not deſirable.

deſirable *. Examine the bottom of the pot or pan frequently. If the heat ſhould riſe too violently, raiſe it a little, to prevent the young fibres from being ſcorched; if neceſſary, place it entirely on the ſurface; and, if requiſite, give a little water, which, however, ſhould have ſtood in the frame, or any other place of equal temperature, for ſeveral hours before.

It is not a common practice to work by the thermometer in hot-beds, but it is certainly as eligible here as in the ſtove, &c. The air of the ſeed-bed ſhould raiſe the mercury on Fahrenheit's ſcale to 65° on a medium, allowing 5° of a fall ~~or riſe~~ for the changeableneſs of the weather at this ſeaſon. By this, alſo, it will be ſeen to what extent matting is neceſſary.

When the plants have arrived to the height of about an inch, they will be fit to prick out, into nurſing pots, which ſhould be about four inches in diameter, and the

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* In treating of the cultivation of aſparagus on a dung hot-bed, I have given directions for drawing off the rank ſteam; which I hope will ſuffice the reader for that operation, when neceſſary, in hot-beds, at any time.

plants, till they begin to ſhew fruit; I will ſay no more on that head, but ſhall return to it after having conſidered the article pruning or ſtopping. That it is indiſpenſably neceſſary, as ſome pretend, to pick out the heart-bud when the plant hath formed its rough leaves, I can by no means ſubſcribe to; for, from the moſt minute obſervation, and the faireſt trials, which I have repeatedly made, I am convinced it is of no conſequence whether the bud is picked out or not: I ſeldom think of picking or pinching, till the plant begins to put forth runners or vines, nor even (unleſs it happens to put forth too few to furniſh its ſide of the frame) till I perceive the rudiment of the fruit. It is then time to ſtop thoſe vines which have fruit ſhewn: but the others may be ſuffered to run to the length of ſix or eight joints; and ſhould then be ſtopped, to make them put forth fertile ones, which they will ſeldom fail of doing, if the plants are healthy.

If an extraordinary quantity of male bloſſom ſhould appear, let a part of it be gently rubbed off with the finger and thumb;

thumb *; but I do not approve of this being done when an ordinary ſhew of theſe bloſſoms only appears. Nature ſhould be kindly aſſiſted; but neither ſpurred nor thwarted, where it can be avoided. When the female bloſſoms are ſufficiently advanced, let them be carefully impregnated with the ſtrongeſt and moſt healthy of the males, which will greatly promote the ſwelling of the fruit. And let it be here obſerved, that, if the fruit or female bloom is not impregnated with the male, it will not ripen its ſeed, although the fruit may ſwell to a good ſize, and be very fit for the table: and although it often happens that the farina of the male is carried, by inſects, &c. and the wind paſſing through the frame, to the object of its deſtination, yet it is a more certain way to be at the trifling trouble of doing it with the hand; as handſomely ſet fruit can be marked for ſeed with a greater degree of certainty,

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* I would here obſerve, that the knife ought never to be employed in the pruning of Cucumbers and melons, unleſs in cutting out any ſtrong, old vines; and as nothing is more brittle than the leaves of theſe plants, when in a healthy ſtate, they ought to be handled at all times with the greateſt care and delicacy.

and thoſe which are impregnated will ſwell, and be fit to cut much ſooner. The method of performing it is this: Chooſe a ſtrong healthy-looking male flower; pinch it off with the ſtalk; diveſt it of the corolla or flower-leaves, carefully retaining the ſtamens and anthers; taking it between the finger and thumb, apply the anthers to the boſom of the female flower, which is diſtinguiſhable by the newly-formed fruit; and give the ſtalk a ſharp twirl, whereby the farina of the male will be rubbed off, and depoſited on the ſtigma, the female organ of fructification.

If no accident hath happened the plants, they will have made good progreſs before the bed has, in any great degree, loſt its heat; and indeed, generally a few of the firſt ſet fruit are cut by that time *; which, ſuppoſing the bed was built about the middle of February, and the plants were planted about the 23d or 24th, ſhould be fit for cutting

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* This depends much on the kind of Cucumber ſown; and, as the kinds are now ſo numerous, and almoſt every gardener having his particular favourite, it might be deemed preſumptuous in me to ſay *which* ought to be preferred, eſpecially as many known kinds have an equal title.

cutting by the middle or latter end of March, if the weather has been tolerably favourable.

If the heat has by this time conſiderably decreaſed, let preparations be made for lining the back and both ends, by ſlightly fermenting a quantity of freſh ſtable-dung, and mixing it, in the operation, with the old ſide and ends of the bed; which let be cut off, in the manner as directed for the aſparagus bed (See page 15.), and let it be made up as it ſubſides: after which, cover it with turf or mould. The frame muſt be raiſed with bricks or tiles occaſionally, as the plants advance in ſtrength; ſo as to keep the glaſs free of the foliage.

By this time, alſo, the hills will require to be enlarged; as the roots will have made great progreſs. Therefore, let the ſurface of the bed be forked up with a ſmall hand-fork, ſuch as is uſed for plunging pine-pots, &c., to the depth of the ſurface of the ſand or tan; and, if any of it has been burnt, (which I have but twice experienced in any hurtful degree), let it be replaced with freſh mould: Work gently into the ſides of the hills with the fork, till the roots begin to appear, and, if needful, pour in a little water; after which, let the ſurface be levelled up to the height of the hills, with freſh mould of the ſame quality as at firſt *. This operation, however, ſhould either be done a few days before the application of the linings, or ſhould be deferred till a few days after; that the plants may not experience a check, by the bed being cooled both without and within at the ſame time.

The plants will now grow vigorouſly, and produce fruit in abundance: and muſt forthwith have a large ſhare of freſh air admitted every day, increaſing the quantity as the ſeaſon advances; and, when the month of May arrives, in fine, mild weather, the glaſſes may be entirely taken off in the day. Let them have large and frequent quantities of water given from the roſe

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* I have here directed the bed to be earthed entirely up at once; which, if the forcing is not begun ſooner than recommended above, will be found quite ſufficient: but, if the forcing were begun a month or ſix weeks earlier, it would be imprudent to earth up the bed entirely at once, as a ſtronger bed and more linings would be required; and, conſequently, the riſk of burning the roots would be greater.

roſe of a watering pan; taking the advantage of warm ſhowers as the ſeaſon advances. Few plants require more of this element than the Cucumber; and if it is withheld, the plants will, to the nice obſerver, quickly complain.

The moſt proper time for the application of water, is either in the morning about eight, or in the evening about four o'clock, an hour ſooner or latter, according to the ſeaſon of the year. The water, if poſſible, ſhould always be of equal temperature with the air in which the plants grow; in which caſe, no check is felt, or unneceſſary effort made by the tender fibrils, the purveyors of the plant. Nor ſhould an extraordinary quantity be applied at a time, for the ſame reaſons.

Keep them moderately thin of vines and leaves; taking care to lay them all out in regular order, and not to have them croſſing one another. Be alſo careful to diveſt them of all withered and damped leaves, as they appear. It is as obnoxious for a plant as an animal, to breathe the air wherein its own corruption is confined. Neither ſhould the Cucumber be pruned *much* at a time, otherwiſe, by the wounds bleeding, the plant will be greatly exhauſted.

About the beginning or middle of April, it may be neceſſary to line the front of the bed, which let be done in the ſame manner as the back and ends; but it will be quite unneceſſary to renew theſe, as that of the front will throw in a kindly heat, which will laſt all that month, and afterwards bottom heat is of little conſequence.

Succeſſional beds for Cucumbers may be built in March, and in April. The ſame culture, as above, is to be practiſed; obſerving to make the beds a little lighter, as the ſeaſon advances.

As I am to treat of the raiſing of *melons* in flued pits, when the culture of that plant is treated of, and as the culture of the two plants there are ſo nearly ſimilar; I ſhall only obſerve here, that the ſame mould muſt be uſed for the Cucumbers as is recommended above, and a greater portion of air and water muſt be given, than to the melons.

The culture of Cucumbers under hand and bell glaſſes, although a ſpecies of forcing,

cing, being ſo generally underſtood, and inſuſceptible of improvement; it may be unneceſſary to waſte time in ſaying more on that head, than that they ſhould be planted in mould of the ſame quality as above directed, ſhould have plenty of water given them in hot weather, and, as much as poſſible, ſhould be defended from cold and damp in Autumn.

I ſhall conclude this article, by obſerving, that I have ſeldom known any inſect to infeſt the Cucumber, except the aphis, which, in any ſtate or ſituation, is quickly deſtroyed by the fumigation of tobacco; a proceſs that is familiar to almoſt every gardener.

the border will require no other preparation than being well enriched with ſtable-dung, and if poſſible, a little marl; which ought to be trenched and well mixed, twice or thrice during the Summer before planting.

But, if the ſituation is wet, the bottom a cankering gravel or cold clay, and the ſoil either a poor ſand, gravel, or ſtubborn clay; care muſt be taken to render them otherwiſe, by paving the border to the breadth of twelve or fourteen feet, running a drain in front to carry off the wet, and removing the bad, and bringing in good ſoil; ſo as to compoſe a rich ſandy loam to the depth of thirty inches at the wall, and twenty-four in front, allowing three or four inches for ſettling. If a new building is erecting for Cherries, it is immaterial whether the building or border is completed firſt, provided the latter has a ſufficient time allowed for the mixing and incorporation of the ſoil; as the front-wall and flue ſtand on pillars, whoſe foundations ought to be at leaſt ſix inches deeper, if the border is not paved, than the ſoil.

About the 1ſt of January is a good time to plant; although a month ſooner or later at this ſeaſon is of little conſequence, as no fire heat muſt be applied the firſt year. Having provided the neceſſary number of healthy, *well-rooted*, maiden, or one-year-trained May-dukes*; let them be planted againſt the trellis at the diſtance of eight, nine, or ten feet, as the length of the houſe will beſt divide; filling in the pits with vegetable mould from decayed tree-leaves, and ſettling all with a little water. Riders, having five or ſix feet *boles*, which have been trained two or three years againſt a wall, and have produced a crop or two, ſhould be provided to fill the upper part of the trellis; where they will produce a few crops before the dwarfs will have extended, ſo as to require their removal. Theſe will generally produce a few fruit the firſt, and probably will yield a full crop the ſecond year.

Let the ſurface of the border be forked over once or twice a-year; and let a little well-rotten dung occaſionally be worked

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* Experience ſhews that no other Cherry deſerves a place in a forcing houſe.

worked in. This may be performed in any of the winter months.

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SECTION III.

On Training the Dwarfs.

THE dwarfs or principals being the only plants intended ultimately to fill the trellis, I ſhall diſcuſs what relates to training the riders by obſerving, that, as theſe are planted ſolely for the purpoſe of obtaining a crop or two, while *thoſe* are making their wood and forming their fruit ſpurs, and, by being checked by their removal, may not be expected to put forth much young wood while they remain here, it will be unneceſſary to thin them out much; but let them be dreſſed regularly to the trellis, and, unleſs neceſſary to fill a blank, diveſt them of any ſhoots they make, paying reſpect to their fruit ſpurs only; for when they have ſerved the purpoſe here, they will be of no further uſe.

After planting, let each ſhoot of the dwarfs, if maiden trees, be headed down to two or three eyes; in order to make them put forth vigorous ſhoots, to furniſh the trellis, from the bottom: and, if they have been one year in training, let the bottom branches be laid well down, and let the reſt be dreſſed in a regular manner to the trellis, uſing ſtrings of freſh matting to tie with; being careful to allow full room * in the ties, as much miſchief is done to fruit, eſpecially Cherry-trees, which are ſo apt to gum, if not allowed a ſufficiency of room.

The Cherry-tree being apt to gum, and the branches to decay, from the ſlighteſt injury, it would be imprudent to train it horizontally; in which caſe, the loſs of a branch is ſupplied with much more difficulty, than when trained in the fan manner: this laſt method I would therefore recommend.

When the tree hath produced its ſhoots to the length of five or ſix inches, let them be gone over and thinned, ſo as that they may be laid in at about the diſtance of ten or twelve inches; obſerving to pinch off

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* I make it a rule to allow every ſhoot as much room in the ſhred, or tie, as will at leaſt admit another of the ſame ſize along with it.

ſuch as are produced fore-right, and which are, from their appearance, not forming for fruit ſpurs: and, as they advance, let them be regularly diſpoſed, and diveſted of any laterals they may produce. If all has gone well, at the end of the firſt year they will have produced ſhoots from twelve to thirty inches long; which ſhould then be ſhortened down to about two-thirds of their length. This is neceſſary, in order to make them ſhoot ſtrongly, and that the trellis may be furniſhed from the bottom, in a regular manner.

The ſecond ſeaſon, they will ſhoot vigorouſly, and will begin to form many fruit ſpurs on the preceding year's wood; which muſt be encouraged, for the production of a few fruit next ſeaſon. Keep the tree clear of all ſuperfluous and lateral ſhoots; and lay in the leading ones at the diſtance of eight or nine inches, which forthwith muſt be conſidered as the medium: and, at the end of the ſeaſon, ſhorten a few of the ſtrongeſt branches alternately, ſo as to make them break their buds in the ſpring, in a regular manner; as, henceforth, they will not require to be ſhortened.

The third ſeaſon, they will produce a few fruit, make fine ſpurs and moderate ſhoots; which, as they advance towards the riders, give place to, by lopping off their branches, or thinning away their foliage, ſo as to afford a free circulation of air and admiſſion of ſun.

The fourth ſeaſon, they will produce a full crop of fruit; and will poſſibly make ſuch progreſs towards the riders, that theſe muſt be diſpenſed with: in which caſe, it will be adviſable to ſacrifice whatever fruit, or appearance thereof, there may be on them, to the encouragement of the principals.

After the trees have filled their ſpaces, and have begun to bear plentiful crops of fruit, they will make little or no wood; and will require no further care, on the ſcore of training, than to ſupply the place of any branch that by accident may die out.

SECTION IV.

On the Temperature of the Cherry Houſe.

THE Cherry, from its nature, will bear very little artificial (eſpecially fire) heat. For which reaſon, I would not adviſe the forcing of it too early, eſpecially if there is only one compartment for its culture; ſince, in that caſe, there would not be a continued ſucceſſion for the ſupply of a table, and furniſhing a deſert, till they came in on the open walls. I conſider the firſt or middle of February to be an eligible time for the commencement of the forcing; but, for a new planted houſe, the third year ought to arrive before fire heat is applied. Were it not for the ſake of other articles that may be placed or planted in the Cherry houſe, it would be better that the glaſſes were not put on the firſt ſeaſon at all; but this is generally too great a ſacrifice: however, if they are put on, a free circulation of freſh air, even in the night, ought to be encouraged.

Suppoſe then, that, the third year after planting, the trees have made good progreſs, plenty of fruit ſpurs, and that a reaſonable hope of ſucceſs is entertained; let the glaſſes be put on about the middle of January, plenty of air admitted through the day, and ſhut up at night. On the firſt of February, light the fire; which muſt be made ſo moderate, that at eight at night, and eight in the morning, Fahrenheit's thermometer may not ſtand above 40°. In which condition keep it, as nearly as poſſible, till about the 20th of the month; and then increaſe gradually to 45°: at which point endeavour to keep it, till the fruit is fairly ſet. Afterwards increaſe the heat to 50°, but not more, till the ſtoning is over, and the fruit have begun their ſecond ſwelling.

Although, for the ſake of the fruit, all danger will now be paſt; yet, if too ſtrong a fire heat be afterwards indulged in, it will have the tendency of drawing the ſhoots up too weak; and, therefore, I would not adviſe that the air of the houſe, at the fore-mentioned hours, ſhould ever paſs 60°.

SECTION V.

On the Admiſſion of Air to the Cherry Houſe.

AS has been already hinted, the houſe ought to be uncovered all the firſt ſeaſon after planting: but, if this is not the caſe, and if, from the nature of what other plants are placed therein, it would be imprudent to leave a little air in the night; let the houſe be opened by ſun-riſe in the morning, have a large and free circulation all day, and be ſhut up at ſun-ſet. However, when the month of May arrives, it ought to be entirely uncovered.

The ſecond ſeaſon, let the glaſſes be put on by the firſt of March; let large portions of air be admitted, as directed above; and let the glaſſes be removed by the firſt of Auguſt.

From the commencement of the forcing, this article muſt be attended to more particularly:—The firſt ten days after which, a very large ſhare of air ſhould be given, to prevent the buds from breaking too ſuddenly, and of conſequence too weakly:

for, vegetation, in forcing, ought always to be brought on, as it were, by ſtealth: the juices flow more kindly; and the plant ſuffers the firſt impulſe of reviving activity with more patience, than when hurried on in a violent manner. But, after the buds begin to appear turgid, a more moderate quantity may be admitted; ſtill having reſpect to the temperature of the houſe, and the prevention of froſty winds from hurting the bloom. At all events, take advantage of ſun-ſhine; which will allow a larger portion to be given, than at other times. Nevertheleſs, let no day paſs, (unleſs in a ſevere froſt), wherein leſs or more air is not admitted; and, in ſun-ſhine, to the extent that the thermometer may not riſe more than 10 degrees above the fire-heat medium.

After the crop is all gathered, if conſiſtent with the welfare of the other articles contained in the houſe, let the glaſſes be removed, and the trees be expoſed to the weather till the next ſeaſon.

SECTION VI.

On Watering, Waſhing, and Steaming the Cherry Houſe.

AFTER planting, let the mould be ſettled to the roots of the plants by a moderate watering; and, if the houſe remain uncovered the firſt ſeaſon, little attention, except in dry weather, will be required in this article. Let due attention, however, be paid the ſecond year, to keep the border in a moderately moiſt ſtate, that the plants may grow freely; and, when their growth is ſtopt for the ſeaſon, withhold the water, that the wood may ripen perfectly before they are expoſed to the weather.

From the commencement of the forcing, give plentiful waterings to the border, until the bloom begins to open; and then in a more moderate degree, till the fruit is fairly ſet. After which, again increaſe the quantity, till the fruit begins to colour; and then diminiſh it by degrees, till it be entirely withheld, which ought to be done ſome little time previous to the fruit's being ripe; as otherwiſe, it would be rendered inſipid.

Waſhing with the hand-engine, ſhould commence with the day the fire is lighted; and, except from the time the bloom begins to appear, till the fruit is fairly ſet, ſhould be repeated thrice a-week in the evening, and that with a conſiderable degree of force, till the fruit begins to ripen. The uſe of the engine here, and indeed in all forcing houſes, is much preferable to the pampered traſh of ſteaming apparatus. It is not merely to refreſh the foliage that the engine is employed, but alſo to clear it of duſt, inſects, &c., a matter of evident neceſſity; for, the leaves being, as it were, the lungs of the plant, how can we ſuppoſe it in health while theſe remain clogged? Hence it becomes a duty, in the uſe of this inſtrument, to apply it with force: more ſo in the hot-houſe than out of doors, for the plain reaſon, that here the wind is not equally helping to this effect.

In the interval of waſhing, (viz. while in bloom, and till the fruit is ſet), let a little water be poured on the flue every evening when the fire is ſtrongeſt; which will cauſe a fine agreeable ſteam * to ariſe in the houſe, greatly to the benefit of the flowers and foliage: For at this time, water from the engine cannot, with propriety, be applied, leſt the tender bloſſoms might be injured.

Soft and tempered water ſhould be uſed at all times, and on all occaſions.

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SECTION VII.

On the Inſects that infeſt the Cherry Houſe, and how to deſtroy them.

THESE are, the aphis, or green fly; the acarus, or red ſpider; the caterpillar;

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* I do not conſider the Cherry houſe of ſuch importance as to be at the expence of erecting ſteaming apparatus purpoſely for its uſe; nor, indeed, do I think it worth the while to do ſo for the uſe of any kind of forcing, except a range of peach houſes: in the near neighbourhood of which were it placed, a pipe might (if at a ſmall expence) be borrowed for its uſe. But, at all events, I prefer ſteam which is produced from an earthen flue, to that produced from boiling water.
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pillar; and the grub*. The firſt, and leaſt hurtful, is eaſily deſtroyed by a fumigation of tobacco. The ſecond, may be ſuppreſſed by the proceſs of waſhing with the engine, which is indiſpenſably neceſſary to the health and vigour of the trees. Therefore, when they begin to make their appearance at any time, let the water, in the ordinary courſe of waſhing, be thrown againſt the trees with greater force; making a point of beginning at the contrary end of the houſe each time; whereby, if any part ſhall be miſſed the one way, it may be hit the other.

The caterpillar and grub, have given me more trouble than the preceding, or indeed any ſpecies of inſect whatever; and, after trying a variety of preſcriptions, and having been at much trouble and expence, I can venture to aſſure the reader, that I have at laſt diſcovered a cure: the receipt of which I ſhall candidly give; and hope that none will attempt to uſe it without giving it a fair and impartial trial.

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* Not the land-grub:—a ſmall greeniſh-black worm, of the caterpillar kind, with a black head, about three-eights, or half an inch in length, often called "the "grub" by gardeners. It is generally found rolled up in a kind of down or wool, in the leaves of cherries, apricots, &c.

Take of ſoft ſoap, two pounds; flowers of ſulphur, two pounds; leaf, or roll tobacco, one pound; nux vomica, two ounces; and oil of turpentine, half an Engliſh gill: boil them all together in eight Engliſh gallons of ſoft or river water to ſix; and ſet it aſide for uſe.

Any time in winter, at leaſt a conſiderable time before the trees begin to vegetate, let them be all untied or unnailed from the trellis or wall; bruſh every part of the branches and buds clean with a ſoft bruſh, ſuch as is uſed for painting: make the liquor milk warm; and, with a ſpunge, carefully anoint every part of the tree, trellis, &c. Dreſs the trees neatly to the trellis again; but uſe none of the old ties or ſhreds: and let this operation be repeated every winter * without reſerve. The firſt ſummer after anointing there may a few appear, whoſe eggs have, by being concealed, eſcaped the action of the liquor, which

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* This precaution is neceſſary, theſe inſects being evidently blown by a fly in Summer.

which muſt be picked off, to prevent their breeding; but, if any, there will very few remain, as it is of the moſt penetrating nature.

This liquor muſt on no account be uſed in ſummer, as it inſtantly deſtroys the foliage; the fatal effects of which myſelf once experienced, through inadvertency. The moſt proper ſeaſon for its application is between the fall of the leaf and the firſt of February, for trees growing out of doors; for trees in hot-houſes, a month at leaſt before the forcing commences. Fruit-trees of all kinds ſhould be anointed with this compoſition every year; as it is equally deſtructive of all inſects, and their eggs, which infeſt them: but ſurely none, who have the health and beauty of the trees contained in their hot-houſes at heart, after being convinced of its efficacy, will be ſo neglectful of their own intereſt, as to omit doing it, ſince neither the trouble nor expence are great.

SECTION VIII.

On the Cultivation of Cherries in the Conſervatory and Peach Houſe.

CHERRIES are often brought to early perfection in theſe forcing compartments; by being ſometimes planted in pots, ſometimes in the borders as low ſtandards, and ſometimes as rider ſtandards: all which methods are attended with various ſucceſs, from the circumſtance of their being a ſecondary object.

Having, in the ſeven preceding ſections, treated methodically of the cultivation of this fruit; it may be unneceſſary to enlarge more on it here. I ſhall therefore paſs over the further conſideration of trees planted in the border; and conclude this chapter by dropping a few hints on the utility of cultivating a few dwarfs in pots or boxes.

Where there is an extenſive variety of forcing, and a green houſe, or conſervatory, Cherries may not only be produced at an early ſeaſon; but may be continued in a long ſucceſſion, by removing the pots or boxes from one houſe to another. Suppoſe there are forty trees provided for this purpoſe; let them be divided into four or five equal parts, to make as many ſucceſſions; and let them be placed in equal rotation: firſt, in November or December, in the green-houſe, where let them remain till the fruit are fairly ſet; then, in an early peach or vine houſe, till they begin to colour; and, laſtly, in the pine or dry ſtove, to come to maturity.

Let very rich compoſt, ſuch as is recommended for cucumbers or melons, be made uſe of; and water the boxes frequently with the drainings of a dunghill. Waſh or water the plants alſo frequently over head with a hand ſquirt or watering pot; and place them in the moſt airy ſituations, in the conſervatory, ſtove, &c.

It may be neceſſary to remark, that after plants are inured to this mode of culture, provided due attention is paid to the ſtate of their roots, they are, and will continue to be, very prolific of fruit, though dwarfiſh, and unproductive of ſhoots and foliage. Their roots ſhould therefore be examined each ſeaſon, and, if neceſſary, the ſpace about them ſhould be enlarged, by removing the plants into other pots, boxes, &c.; uſing freſh, rich mould; and undoing any matted part about the bottom or edges of the ball, before it is replaced. When the plants are all ſhifted, give the roots a moderate watering, and let them be placed in a dry, free expoſure in the open air, till again wanted for forcing.

CHAPTER IV.

FIGS.

SECTION I.

On the Conſtruction of the Fig-Houſe.

FORCING of this fruit is in pretty general practice, particularly in England, but I believe there are few houſes built *ſolely* for the purpoſe. Figs are moſt frequently forced in other compartments, as peach-houſes, vineries *, &c.; but I am of opinion the cherry-houſe ought to be preferred; the ſoil and climate which ſuits the one, nearly agreeing with the nature of the other, in forcing.

However, were a houſe to be erected for the forcing of this fruit alone, I heſitate not to ſay, that I am convinced ſuch as is repreſented by fig. 1. Plate II. would be found

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* Figs may be cultivated with ſucceſs, in the ſame manner as adviſed for cherries, Section VIII. of the preceding Chapter.

found to anſwer the purpoſe perfectly. In this caſe, the trees are to be planted and trained to the trellis placed againſt the back-wall; and a row of dwarfs may alſo be planted in the border, provided it is not to be otherwiſe occupied.—See Section I. of the preceding Chapter.

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SECTION II.

On preparing the Border, and planting the Trees.

WHAT has been ſaid in Section II. of the preceding Chapter, reſpecting the preparation of the border, will alſo apply here, except that the ſoil ſhould be made ſomewhat richer for Figs than for cherries.

Plants which have been a year or two in pots, and which have good roots, are to be preferred.

The kinds fitteſt for forcing are, The Blue Iſchia, the White Iſchia, the Brown Iſchia, and the Black Genoa.

They may be placed on the trellis, at the diſtance of nine or ten feet apart; and in the border, to be kept dwarfiſh, at about
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five or ſix aſunder. The ſeaſon of planting is from the firſt of November to the firſt of March.

Rider cherries may, with propriety, be planted between thoſe on the back-wall; as, eſpecially if they have been a year or two in training, a few crops may be expected before it would be neceſſary to remove them. Fill in the pits with rich, light compoſt, and ſettle all with a little water.

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SECTION III.

On Training and Pruning.

THE chief art in training the Fig is, to keep every part of the trellis full of young ſhoots, the plant naturally running into naked unſightly branches in the middle. Shoots, however, may be produced with facility, by *ſhortening*: they alſo riſe abundantly from the root, round the ſtem of the plant. Producing its fruit on the ſhoots of the preceding year, theſe, if well ripened, ſhould not be ſhortened, but ſhould be laid in at full length, and at the diſtance of about twelve or fourteen inches from each other.

When the trees arrive at a bearing ſtate, the knife ſhould be uſed with caution; for the more their branches are lopped, the greater a profuſion of ſhoots will follow in conſequence; nor will ſuch generally be fruitful, but ſoft and ſpongy. The moſt fruitful ſhoots of the Fig are ſhort-jointed, round, and of little length in proportion to their thickneſs. But

The reader may ſee farther on this ſubject in Book II. Chap. I. Sect. IV.

SECTION IV.

On the Temperature of the Fig-Houſe.

THE Fig will bear but a ſmall degree of fire heat; nor ſhould it be forced much at any period. Keeping this in view, I would not adviſe that fire be lighted the two firſt ſeaſons after planting; but the third year, a gentle fire heat may be kept up in the months of March and April, in order to forward the wood for forcing the fourth. At this time, Fahrenheit's thermometer ſhould not ſtand, at eight at night, and ſeven or eight in the morning, above 50°.

The fourth ſeaſon, provided the plants have ſucceeded tolerably well, they may be forced from the firſt or middle of February. If the houſe has been uncovered for the winter, or if the glaſſes have been kept on, let it be ſhut up at night, encouraging a free circulation of air in the day, from the middle of January: Make the fires ſo moderate for the firſt fortnight, that the thermometer may not ſtand above 45 at the above-mentioned hours. In the courſe of the ſecond fortnight, increaſe the heat to 55° in a gradual manner; and in the courſe of ten more days, to 60°, at which continue for the ſeaſon, with as little variation as poſſible.

The following, or fifth ſeaſon, the houſe may be forced from the middle of January; but earlier than this I cannot approve. The rules above are to be followed the more ſcrupulouſly that the plants are forced early.

SECTION V.

On the Admiſſion of Air to the Fig-Houſe.

THE three firſt ſeaſons, large portions of air ſhould be admitted every day; varying the quantity, however, according to the ſtate of the weather, and the ſtate of growth the plants may be in; for ſudden checks are hurtful to this plant, as to others, although their bad effects may not be ſo immediately perceptible.

In the fourth and fifth ſeaſons from the commencement of the forcing, and for the firſt month or ſix weeks, admit air in ſuch quantity in the day, that the thermometer may not riſe to more than five degrees above the fire-heat medium. As the ſeaſon advances, air may be more freely admitted. Let this be done in a liberal manner, and to the extent that the mercury, at no time, may riſe to more than 10° above the forementioned medium.

From the middle of May, or the firſt of June, the houſe may ſtand open night and day, in moderate weather. But the glaſſes ſhould not be entirely removed till the crop is ripened off; becauſe, by keeping them on, the flavour of the fruit may be conſiderably enhanced. The ſhoots may be better ripened, and the fruit, for the ſucceeding year's crop, may be better ſet and forwarded by retaining the glaſſes for a while, than by removing them too ſoon.

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SECTION VI.

On Watering and Steaming the Fig-Houſe.

THE border ſhould be kept moderately moiſt at all times, except when the fruit is ripening off, when it ſhould be kept rather in a dry ſtate. This is neceſſary, becauſe, otherwiſe, the fruit would be apt to drop; nor would it be well flavoured, but inſipid. After the fruit are gathered, however, the border ſhould again be brought to a proper ſtate, by the application of a few hearty waterings.

Let the foliage be duly refreſhed, twice or thrice a-week, by the hand-engine; which ſhould be applied with ſome degree of force, in order to keep the leaves clear of duſt, &c. As the fruit approaches to maturity, this may be withheld in a great meaſure, and unleſs the plants are afflicted with the red ſpider *, entirely, till the fruit is gathered.

Steaming can be little neceſſary to the welfare of the Fig, ſince the engine may be worked at all times. The fear of hurting the bloom, unleſs the watering be performed in a very wanton manner, cannot poſſibly attach here, as in the cherry, grape, or peach houſe: And this is a circumſtance ſo far happy, as the temperature of the fig-houſe is ſuch, as ſeldom to admit of the flue being heated enough to excite ſteam in any great quantity.

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* I have not known any other inſect *materially* to afflict the Fig in the hot-houſe. Waſps, however, are fond of the fruit.

CHAPTER V.

GRAPES.

SECTION I.

On the Conſtruction of the Grape-Houſe.

THIS delicious and juſtly-eſteemed fruit is now cultivated with ſuch general eagerneſs in this country, that a garden unprovided with one or more compartments for its production is not only reckoned incomplete, but hardly to be met with *. Theſe vary exceedingly in conſtruction; and, although *ſome* lay great ſtreſs on this article, and there are extremes which ought not to be followed, yet I am convinced the failure of ſucceſs, in the production of the Grape, is much leſs a conſequence of *bad* conſtruction in the houſe, than in the preparation of the border, the choice of the kinds, and the general management. I have formerly had the conſtruction of three ſeveral and differently-conſtructed Grape-houſes in the ſame garden *, under my care, for years, which then uniformly produced excellent crops. This, in my opinion, is a proof of the neceſſity of a greater niceneſs in the formation of the border being obſerved, than in the conſtruction of the houſe; the fire-place and flues excepted.

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* I would here be underſtood as ſpeaking of noblemen's or gentlemen's gardens in general, although there are alſo ſome Grape-houſes found in market gardens.

A perfect command of fire heat is abſolutely neceſſary in the Grape-houſe; to effect which, proper attention ſhould be paid to the conſtruction of the fire-place and flues.

Fig. 1. Plate V. repreſents a furnace, and the entrance to the flue, on a plan that has given the higheſt ſatisfaction for many years: and although I ſhould be ſorry to adviſe unneceſſary alterations in houſes already built, yet I could wiſh to ſee all hot-houſe furnaces conſtructed on the ſame plan; from a conviction of the utility, not only in ſaving fuel, but in enabling the operator to work with a degree of

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* Wemyſs Caſtle.

of exactneſs, and to enjoy a leſs diſturbed repoſe in winter nights, than is generally done.

Fig. 1. and 2. Plate III. repreſent two different plans of Grape-houſes; which, if minutely copied, it is preſumed, will not fail of giving ſatisfaction. Any alteration in the breadth and height, I would beg to caution againſt; but the length may be extended or leſſened at pleaſure, provided reſpect is paid to the proportion of fire heat here allowed.

SECTION II.

On the Situation and Preparation of the Border.

THE ſite of the Grape-houſe is an object of ſuch conſequence to the welfare of the plant, and ſucceſsful cultivation and production of well-flavoured fruit, that the greateſt care is neceſſary in the choice of it; and, where the ſituation is not naturally good, the ſparing expence, in rendering it ſo, is the cauſe of many diſappointments. I ſhall, therefore, point out what I eſteem a good ſituation, and the method of rendering a bad one comfortable.

A gentle hill, having a ſouth aſpect *, and conſiderable declivity that way, the ſoil a ſtrong brown loam of two feet, over a bottom of dry ſand, gravel, or ſoft clay; is the moſt deſirable, and in forming the border, would be the leaſt expenſive of all ſituations. In which caſe, the ſite would require no paving or draining; and would admit of a proper mixture of ſandy loam, vegetable mould, marl, and dung, (by the removal of two feet of the natural bottom), with the natural ſoil, to form a border, perfectly adapted to the growth of the vine, in the following proportion, viz. One half ſtrong brown loam, a quarter light ſandy loam, an eighth vegetable mould of decayed tree-leaves, and an eighth ſtable-dung; to which add about a fiftieth part of ſhell-marl. Such was the compoſition of the vine borders at Wemyſs Caſtle; none of which were formed leſs than four feet deep, and one (owing to the accidental ſituation of the houſe) was ſix.

Nevertheleſs,

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* All hot-houſes ſhould face the meridian ſun, if conveniency will by any means permit; but a ſmall variation to the eaſt or weſt, is not attended with any injurious conſequence.

Nevertheleſs, I would not wiſh to infer, that of the above mixture *only*, vine borders ſhould be made. Every candid gardener will diſcriminate here, and chooſe the compoſition he thinks moſt ſuitable to the nature of the plant in queſtion. But I would remark, that I have never known any to err, by forming vine borders too deep, or of too rich materials.

The nature of the plant, is to puſh its roots downwards, and extend them widely; conſequently, our duty is to cheriſh, and not to thwart, its inclinations. We perhaps do them a violence, even by our greateſt care and attention, in this mode of culture; ſince we impoſe on them a ſoil, climate, and an air, altogether artificial.

The breadth of the border for a houſe, as repreſented by fig. 1. Plate III. ſhould be all the width of the houſe within, and at leaſt ten feet without; and for ſuch a one as is repreſented by fig. 2. ſhould be to the extent of twelve or fourteen feet beyond the front-wall.

Having ſhewn the compoſition, breadth, and depth, the borders ſhould be of, in a good ſituation; I ſhall only obſerve, in reſpect of the contrary, that, if it lies low, damp, and flat, it will be adviſable to raiſe an artificial hill, to the height of three feet above the common level, (allowing the ſurface to be one foot deep of tolerably good ſoil), compoſed of the above-mentioned materials, which may be mixed with the natural earth, and of the full breadth, as aforeſaid: pave * the bottom in a ſloping manner all round, and, if neceſſary, run drains to carry off the wet; and here erect the Grape-houſe.

As the plants are to be planted within the houſe, it is obvious, that both the front wall and flues muſt ſtand on pillars; whoſe foundations muſt be to the depth of the pavement in the one caſe, and ſix inches deeper than the ſoil in the other.

The compoſt muſt be well prepared, by trenching and mixing it, three or four ſeveral times during the Summer preceding the planting; and the building may be going on at the ſame time.

Let the ſurface of the border, both without and within the houſe, be forked up annually,

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* For a more economical method of making a bottom, ſee Book II. Chap. 1. Sect. 2.

annually, and let a little rotten dung be worked in. Hence it appears, that I do not approve of the border without the houſe being made a walk of, as directed by ſome; nor even do I approve of its being cropped with vegetables, unleſs in a very ſlight manner. Wooden walks ſhould be uſed within the houſe, which ought to be compoſed of ſpars, placed within two inches of each other, to the breadth of eighteen inches; and theſe ought to be ſupported from the ground by tiles or bricks, that a circulation of air may be admitted to the border underneath.

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SECTION III.

On Preparing the Plants.

IF plants of proper kinds, and which have been one or two years in pots, cannot be procured, recourſe muſt be had to producing young ones by cuttings, which is the moſt certain and ſpeedy method.

The vine may alſo be propagated with facility, by layers, and by ſeeds; both which methods, however, are in ſome meaſure
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ſure objectionable; the former, becauſe that the plants thus obtained are apt to grow "much to vine and little to wine;" and the latter, on account of the difficulty of procuring effectually ripened ſeed; and that, even in this caſe, it is apt "to ſport." Let us follow the moſt approved mode, viz. by cuttings. And,

For this purpoſe, in the pruning ſeaſon, make choice of a quantity of the under part of the beſt-ripened, roundeſt, and ſhorteſt-jointed ſhoots of laſt year; which let be cut off with two inches of the former year's wood *, headed down to three eyes, tied in parcels, numbered and regiſtered according to their kinds, and ſtuck into the earth in a dry ſituation till wanted.

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* Mr Speechly mentions ſeveral methods of making vine cuttings; and particularly recommends *that* by one eye. I have given them all fair and frequent trials; and, after all, am inclined to ſtick by the old-faſhioned Mallet method. I have always found the ſtrongeſt plants to be obtained by it.—But, to make the moſt of a rare kind, the method by one eye is of great advantage. It is performed by cutting off the bud, with half an inch of the ſhoot below, and one inch above, in a ſloping manner; and placing it againſt the ſide of the pot facing the ſun, to the depth of half an inch.

About the 1ſt of March, let a bed, in all reſpects the ſame as that which is recommended for aſparagus, (See page 11), be provided; obſerving to lay a few inches more of old tan on the ſurface, and of a ſize correſponding with the number of cuttings required. Take garden-pots about ſix inches in diameter, and the ſame in depth; fill them with entire vegetable mould of decayed tree-leaves; place two cuttings in each, ſo deep as to cover the undermoſt eye an inch; and plunge them to the brim in the tan. Cover at night with mats, if neceſſary; admit plenty of air, in good weather, through the day; and refreſh duly with well aired water.

The plants will grow a-pace: and, to their encouragement, let the bed be lined, when neceſſary; and as the ſhoots approach to the glaſs, let the frame be raiſed with bricks, &c. that they may have full room to extend. By the time they have made ſhoots to the length of five or ſix joints, they will require freſh potting; and muſt be put, ſingly, into pots of nine or ten inches in diameter, being filled with half vegetable and half melon or cucumber mould, diveſted of all but one ſhoot, and placed in a vine-houſe, pine-ſtove, or a ſlight hot-bed, previouſly prepared; where let them be duly attended to in the articles of air and water (ſometimes the drainings of a dunghill) during the remainder of the ſeaſon.

Pinch off all laterals and tendrils as they appear; dreſs each ſhoot neatly to a rod; and, when their growth is over, and the wood ripe in the under part, head them down to three or four eyes, and place them in the open ground, in a dry and airy ſituation, till the planting ſeaſon

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SECTION IV.

On Planting, and the Kinds beſt adapted to the Grape-Houſe.

ABOUT ſix feet between the plants is the diſtance they ſhould ultimately ſtand at; but it will be proper to plant them at half that diſtance, as a crop or two may be obtained before it will be neceſſary to thin them out; obſerving to place the kinds two and two together, that, in thinning alternately, any of the kinds may not be totally extirpated.

Suppoſe, then, that the houſe is built, and the border has been prepared conformably to the directions given in the laſt ſection, and that the plants are in readineſs; let pits be made, at the above diſtances, eighteen inches deep, and as much in diameter; fill them half with vegetable mould; take the plants carefully out of the pots with the balls entire, and, unleſs matted, place them ſo in the pits, filling in with vegetable, or other rich, light mould, and ſettling them with a little water. But if the plants have been a conſiderable time in the pots without being ſhifted, and if their roots are in any meaſure matted, it would be improper to plant them ſo; therefore, let the ball, in this caſe, be reduced a little, and let the matted roots be ſingled out; retaining all the fibres poſſible, and ſpreading them carefully out, in placing of the plant. This operation may be performed any time from the firſt of November to the middle of March, with equal ſucceſs *.

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* On the firſt day of May 1793, I planted a Grape-houſe with young plants, ſtruck in February. In 1795 they

Amongſt the numerous variety of Grapes, I do not know above eighteen or twenty kinds worthy of a place in the vinery, and even that number cannot have places in an ordinary-ſized houſe; but, where there are two or three houſes, a variety to the extent of twenty-four kinds may be encouraged, without tranſgreſſing the bounds of moderation. The following is a liſt, viz.

White ſweet Water.
White Muſcadine.
Royal do.
Black do.
Black Frontinac.
White do.
Red do.
Griſly do.
Black Hamburgh.
White do.
White Raiſin.
Red do.
Syrian.
White Tokay.
Flame-coloured do.
White Paſſe Moſque.
Grecian.
White Muſcat of Alexandria.
Black do.
Large black Cluſter.
Black Conſtantia.
White do.
St Peter's Grape.
Lombardy.

Out of which, according to the fancy of the proprietor, may be choſen an ample collection to ſtock any Grape-houſe.

The following is a brief deſcription of their properties and appearances; which, perhaps,

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they had a few fruit; and in 1796, the beſt crop I remember of having ſeen.

perhaps, may help to determine the choice of thoſe who are unacquainted with their qualities.

1. *White ſweet Water.*

This is the beſt early Grape we have. The berries grow cloſe on the bunch, are white, or rather of a ruſſet colour when ripe, round, large, and thin ſkinned; and are replete with an agreeable, ſweetiſh juice. An error, too common, prevails of cutting this Grape ere it be fully ripe. Hence it is leſs in repute than it deſerves to be.

2. *White Muſcadine.*

The berries are of a moderate ſize, white, roundiſh, the ſkin thin, juicy and delicate; the bunch well formed, and moderately large. This Grape is alſo frequently cut before it be perfectly matured; but it is a good fruit, comes in early, and bears abundantly.

3. *Royal Muſcadine.*

This Grape nearly anſwers in deſcription to the preceding, only that the bunches grow much larger, and the wood and foliage a good deal ſtronger.

4. *Black Muſcadine.*

The berries of this kind are black, round, and juicy; the ſkin is thin, the bunch of a moderate-ſize, and well formed. It is a plentiful bearer in general.

5. *Black Frontinac.*

The berries are round, black, of a moderate ſize, and of the moſt exquiſite flavour, as all the kinds of Frontinacs are; the bunch long, unſhouldered, but well formed.

6. *White Frontinac.*

The berries are large, round, and of a greeniſh white colour, except the ſide next the ſun, which, when well ripened, is a pale ruſſet. The bunch is large, and ſomewhat more ſhouldered than the preceding.

7. *Red Frontinac.*

The berries are round, of a browniſh red colour, moderately large, and grow cloſe on the bunch. I know many who eſteem this above all the kinds of Frontinacs, for its high muſky flavour. The plant is a moderate bearer, and produces well-ſhaped, middle-ſized bunches.

8. *Griſly Frontinac.*

The berries are round, of a griſly brown colour, moderately large, and very high flavoured; the bunch of a middle ſize, rather longiſh, and unſhouldered: a great bearer in general, when well managed.

9. *Black Hamburgh.*

The berries are large, black, of a roundiſh oval ſhape, and conſiſt of a pulpy fleſh and thickiſh ſkin; are not of a very high flavour, but agreeably ſweetiſh. The bunches are large, handſomely ſhouldered, and are produced in great abundance: few, if any, grapes exceeding this in luxuriance.

10. *White Hamburgh, or Portugal.*

The berries of this kind are large, oval, of a pale white, thick ſkin, and hard pulpy fleſh; the bunches are large and long, and ſomewhat ſhouldered. The plant is a great bearer, and grows very ſtrong, both in wood and foliage.

11. *White Raiſin.*

The berries are large, white, oval, with a thick ſkin, and hard, firm fleſh. The bunch is long and handſome, in which the berries hang looſely.

12. *Red Raiſin.*

The properties of this kind are much the ſame as thoſe of the preceding, only that the berries are of a reddiſh black.

13. *Syrian.*

Amongſt the coarſeſt of the grape kind, nor has it any property to recommend it, except that it is a good bearer, and produces enormouſly large bunches. The berries are large, round, and white.

14. *White Tokay.*

The berries are white, rather oval than round, of a moderate ſize, thin ſkinned, and grow cloſe on the bunches; which are of a good ſize, and well formed. This is an agreeably flavoured grape, and a pretty good bearer in general.

15. *Flame-coloured Tokay.*

The berries are large, of an oval ſhape, pretty thin ſkinned, of a beautiful flame-colour when well ripened, but not very high flavoured; the bunches are large, and elegantly formed with ſhoulders; and the plant generally produces good crops.

16. *White Paſſe Moſque.*

This is a good Grape. The berries are large, round, and of a yellowiſh white when fully ripe; the bunches are of a moderate ſize, and well formed; and the plant is a pretty good bearer.

17. *Grecian, or Greek Grape.*

The berries are of a middle ſize, of an oval caſt, of a blueiſh-white hue, and grow rather cloſe in the bunches; which are of a moderate ſize, and well-formed. This is a high-flavoured grape, and a plentiful bearer in good ſoil.

18. *White Muſcat of Alexandria.*

The berries are large, oval, of an amber colour, and a high muſky flavour; but the ſkin is thickiſh, the pulp hard, and not very juicy. The bunch is large and handſome, on which the berries hang looſely. On the whole, it is an excellent Grape.

19. *Black Muſcat.*

The berries are round, black, of a middle ſize, thin ſkinned, and of a high-flavour; the bunch is moderately large and well-ſhaped, on which the berries ſit rather cloſe. The plant is a pretty good bearer in general.

20. *Large Black Cluſter.*

The berries are rather ſmall, oval, black, grow cloſe on the bunch, which is not very large, though pretty well ſhaped. The juice of this fruit is harſh, and makes the palate feel rough, as when having taſted Port wine; which is made from this plant alone.

21. *Black Conſtantia.*

The berries are of the middle ſize, rather oval than round, black, but not very high flavoured. The bunch is moderately large, and well formed.

22. *White Conſtantia.*

Much the ſame as the preceding, but on the whole a larger and better fruit.

23. *St Peter's Grape.*

The berries are large, round, and black; the ſkin is thin, and the fleſh delicate and juicy; the bunch is large, and handſomely formed; and the plant is a good bearer.

24. *Lombardy.*

The berries are pretty large, black, rather oval than round; the ſkin is thick, and the fleſh ſoft and juicy. The bunch is very long, and unſhouldered, on which the berries ſit rather cloſely. The plant is a pretty good bearer.

SECTION V.

On Training and Pruning.

IN the laſt Section, I have obſerved, that the plants ſhould be planted at double thickneſs, in order to furniſh the houſe, and obtain a crop or two while the temporary plants remain. Theſe muſt be marked, and conſidered as ſuch from the beginning: and, as the farther mention of them in reſpect of training and pruning would only tend to confuſion, I ſhall ſimply treat of the principals; leaving the thinning away, and final extirpation of the temporals, to the judgment and diſcretion of the operator.

The plants being headed down to three or four eyes, as directed in Section III, will generally puſh them all; in which caſe, rub * off the weakeſt one, and dreſs in the other three, as they advance, at the diſtance of from nine to twelve inches. Pinch off all tendrils and laterals as they appear; making a rule, however, of leaving *all* the laterals above the *laſt tie*, which ſhould not be nearer to the extremity of the ſhoot than ten or twelve inches; as that part, being ſo very brittle, is apt to break, ſhould it meet with any obſtruction, and at the ſame time be confined too near to the point: In caſe of which, it is adviſable to leave the laterals, as above hinted, that one of them may lead on the growth, and become a ſubſtitute to the proper ſhoot.

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* The knife ſhould be uſed as little as poſſible; and, the young ſhoots being of ſo tender and brittle a nature, there is no difficulty in doing all that is required in ſummer dreſſing, with the finger and thumb, except in

When the two ſide-ſhoots have arrived at the height of four or five feet, they ſhould be ſtopped, in order to throw in the more ſtrength to the middle one, which muſt be encouraged, and ſuffered to grow without interruption the whole ſeaſon; not only on its own account, but on that of the roots, whoſe progreſs always bears pace with that of the branches. The uppermoſt lateral

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in cutting out any old ſterile branch: which, however, ought never to be done before the flowering ſeaſon; as, previous to that, much injury would be done by the plants bleeding, which never happens afterwards.

lateral of the ſide ſhoots, after being ſtopped, will puſh a freſh ſhoot; which ſuffer to grow two or three joints, and then ſtop it again, otherwiſe the uppermoſt eye of the proper ſhoot will break. Repeat this operation, on the lateral produced by the firſt lateral, as occaſion may require, till the growth of the ſhoot is quite ſtopped for the ſeaſon.

When the plant has done growing, the wood ripe, and when the leaves begin to drop; it is then the proper time for pruning *. Let the middle ſhoot be headed down to three, four, or five feet, according to its ſtrength; and the two ſide ones to two eyes each.

Next ſeaſon, the plants will puſh vigorouſly. Train the uppermoſt ſhoot of the middle

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* This operation ſhould never be deferred longer: for, if it is, it rarely happens that the plants do not bleed in a greater or leſs degree, the ſtopping of which is attended with much difficulty; and, to effect which, an application of hot wax anſwers as well as any thing. Care ſhould alſo be taken to keep the plants from the extremes of heat and cold for ten or twelve days after pruning, that the wounds may gradually heal, and the pores contract; otherwiſe they are apt to burſt out afreſh, when the forcing is begun.

middle branch to the top of the houſe; ſtop the lowermoſt ſhoot of ſaid branch * when it touches the bottom of the former; and, if the intermediate ones ſhould ſhew fruit, leave two or three with a cluſter at each, and rub off all the reſt. Train the ſtrongeſt, from each ſide branch, to the height of eight or ten feet; and ſtop the others at four or five eyes each.

In autumn, prune them down as follows: The uppermoſt ſhoot on the middle branch to eight, ten, or twelve feet †, according to its ſtrength; the undermoſt on ſaid branch to two eyes; the ſtrongeſt of the two uppermoſt on the ſide branches to five or ſix feet; and the weakeſt, to three or four; and the lowermoſt on each ſide branch, to two or three eyes each, which finiſhes for the ſecond year.

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* Let this be dreſſed to the old wood; paſſing it over, under, or between the fruit ſpurs.

† It may be worthy of remark, that when the plants are in a vigorous ſtate, and puſh forth ſtrong ſhoots, the beſt formed, largeſt bunches, and fineſt ſwelled berries are produced from the extremities of thoſe of this deſcription. Indeed, in all caſes, the handſomeſt cluſters of the branch are produced on its extremities. And this obſervation is not applicable to the vine alone, but to fruit trees of every deſcription.

If all has gone well, the plants will be fit to produce a tolerable crop of fruit the third ſeaſon; for which purpoſe there are now three ranges of ſhoots in height, and at the diſtance of thirty or thirty-ſix inches from each other; having ſhort ſpurs of two or three eyes each, for the production of a ſucceſſion of wood between them, at bottom.

Train the uppermoſt ſhoot on the middle branch to the top of the houſe; the lowermoſt till it touches the bottom of ſaid ſhoot; rub off all the intermediate ones which have no cluſters, and ſhorten thoſe that have, at one joint above the uppermoſt cluſter. Train that ſhoot which was left *longeſt* on the ſide branch, to the top of the houſe: the lowermoſt to the bottom of ſaid ſhoot; rub off what have not, and ſhorten thoſe that have cluſters, as above. Train that ſhoot which was left *ſhorteſt* on the ſide branch, to eight or ten feet; the lowermoſt to ſix or eight eyes; and rub off or ſhorten the intermediate ones, as above. Train the uppermoſt eye of each of the ſpurs, on the ſide branches, to five or ſix feet; and the lowermoſt to as many joints.

Thus will the trellis be completely filled with young wood to produce a full crop next ſeaſon *.

In Autumn, prune down as follows: The uppermoſt ſhoot on the middle branch, to within eighteen inches of the top of the houſe; the lowermoſt † to the length of ſix feet; the uppermoſt ſhoot on the longeſt ſide branch, to within nine feet of the top of the houſe; and the undermoſt to the length of eight or nine feet; the uppermoſt ſhoot on the ſhorteſt ſide-branch, to within nine feet of the top of the houſe; and the undermoſt to five or ſix eyes; the longeſt ſhoot from the ſpurs on the ſide branches, to three or four feet; and the ſhorteſt to two eyes each;—which concludes for the third year.

To the intelligent reader, it would be futile to go through the operation of train-

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* Having made no diſtinction between the two kinds of Grape-houſes in the culture; I wiſh to be underſtood here as meaning the large houſe, the roof of which admits of four ranges of bearing ſhoots; whereas the roof of the ſmall houſe will admit of only three ranges.

† Next pruning ſeaſon this muſt become the middle branch, by the lopping off of all above the bottom of it. See fig. 2. Plate V.

ing and pruning for the next ſeaſon; I ſhall therefore conclude this ſection after having made a few neceſſary obſervations.

It may not be convenient to follow the above directions in all caſes; therefore, much muſt be left to the judgment and candour of the gardener: but I would, in a general manner, caution him againſt any great deviation, and particularly from ſuffering too great a profuſion of ſhoots and foliage in the Summer dreſſings. Theſe, if the health and regularity of the plants are kept in view, will require to be repeated every five or ſix days; and let not this be thought a hardſhip, for, from experimental practice, I can aſſure him, it is attended with more eaſe and leſs perplexity, than when the plants are ſuffered to grow wild as a buſh.

Therefore let all laterals, tendrils, and decayed leaves, be carefully removed as they appear; and when the fruit begins to colour, let at leaſt one-third of the whole foliage be regularly thinned away, which will greatly promote the ſwelling, and render the fruit of an infinitely higher flavour, by the free admiſſion of the ſun and air,

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air, than when ſhaded by the whole foliage, laterals, and tendrils, as is too frequently the caſe.

As there are a great variety in the kinds, not only in the fruit, but in the ſtrength of the ſhoots and ſize of the leaves; reſpect muſt be had to the diſtance they are placed at accordingly, and alſo to the ſhortening of them, both in the Summer and Winter dreſſings.

Pay reſpect to the regularity of the young ſhoots only, no matter how near they lie to, or even if they cover, croſs, or are dreſſed to the old wood; which laſt, let be cut away, when it has done its office.

In the lopping of ſtrong branches, be careful to make clean wounds with the knife; and dreſs off, in a neat manner, the outward ſhreddy bark or rind found on ſuch; which generally becomes a harbour for inſects of the acari tribe, and otherwiſe is very unſightly. The branches ſhould then be waſhed with the liquor recommended in page 62., or at leaſt with a ſolution of ſoap-ſuds and ſulphur.

And

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And for an illuſtration of Autumn or Winter prunings, ſee Fig. 2. Plate V.

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SECTION VI.

On the Temperature of the Grape-Houſe.

FIRE ſhould not be lighted the firſt ſeaſon, unleſs it proves cold or wet, and the wood is not ripened in good time; in which caſe, a moderate fire heat, from the firſt of September, would greatly encourage the growth, and promote the ripening of the wood.

As the plants will bear gentle forcing the third ſeaſon, it will be adviſable to forward them the ſecond, in a moderate degree.

For this purpoſe, let ſlow fires be made about the firſt of April, (by which time the plants will begin to vegetate), ſo as to raiſe the air of the houſe at ſix in the morning and eight at night to about 55°; in the courſe of a fortnight increaſe the heat to 60°; and in another fortnight to 70 degrees; at which let it continue till the firſt or middle of June, and then let fire heat be totally diſcontinued for the ſeaſon.

The third ſeaſon, the forcing may commence on the firſt of March, without injuring the plants; and, if carefully performed, a fair crop of fruit may be obtained. Begin then, by making and regulating the fires, ſo as that the thermometer may not ſtand above 50 degrees at ſeven in the morning, and eight or nine at night; keep it ſo till every eye in the houſe is broke; and then gradually increaſe it to 60, 65, 70; and, when the bloom begins to open, to 75 degrees.

I have already hinted in another part of this work, that vegetation in forcing ought to be brought on as it were by ſtealth; which is the cauſe of my adviſing the above gradual and progreſſive riſe in the climate of the houſe: and if this is not particularly attended to in the firſt ſtage of the operation, *diſappointments* will follow, as the plants will not break their eyes (and of conſequence will not ſhow fruit) regularly.

Keep the air of the houſe as near to

75 degrees, till the fruit is fairly ſet[*], as poſſible; and it may then be let down to 70 or 72 degrees. At this, endeavour to keep it, till the crop is all gathered; after which, farther attention to the climate is unneceſſary.

In the following ſeaſon, the forcing may (if fancy requires) be begun a month or ſix weeks ſooner; that is, about the middle of January or firſt of February; in which early ſeaſon, great attention muſt be paid to the regulation of the fire heat. I believe I have been more ſcrupulous in this particular than moſt gardeners; ſome of whom I know ſcoff at the idea of too much uniformity in the climate, alledging no ſuch ſtrictneſs to be neceſſary, from the unſteadineſs of our own: not conſidering the vaſt diſparity between the unſettled ſtate of the climate in our iſland, and the regular ſerenity that prevails, at all times, on the continent.

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[*] Grapes in general are found to ſet beſt in a moiſt heat of about 75 degrees. But I have found by experience, that all the kinds of frontinacs require a much greater degree of heat, not only when in flower, but from the time the cluſters are diſtinguiſhable; while thoſe of the white ſweet water and white and royal muſcadines, require a much leſs degree: the former being apt to curl up and become ſteril for want of heat, and the latter to produce a greater quantity of ſmall berries in conſequence of too much. Wherefore, if there is any difference of climate (which is ſometimes occaſioned by the placing of the furnaces) in the houſe, the above hint ſhould be taken advantage of.

A month may be gained each year, where there are two or three Grape-houſes, and it is required to have Grapes at a very early ſeaſon; until the forcing is begun ſo early as the firſt of October: but where there is but one or two houſes, the firſt of March in the one caſe, and of January in the other, is quite ſoon enough to light the fires. But of this ſee farther in Sect. XI. of this Chapter.

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SECTION VII.

On the Admiſſion of Air to the Grape-Houſe.

AFTER planting, let a due portion of air be given every day from ſun-riſe to ſun-ſet, until the buds begin to break; after which, obſerve a more pointed regulation, being guided much by the temperature of the weather, and the quantity of ſun-ſhine; admitting leſs or more every day, unleſs the ſeverity of froſty winds renders it imprudent to do ſo. But, as the Summer advances, be very liberal in this article in ſerene weather: it will greatly tend to the ſtrengthening of the young ſhoots.

It is a practice with many to uncover their Grape-houſes in Winter. This I never did, not ſo much that I diſapprove of the practice, but owing to the expence attending it, not only in removing and putting on, but in breaking the glaſſes, and waſting the flues by the extremes of froſt and blanching rains. But, my method has been to admit an equal and free circulation of air, by opening the ſaſhes alternately at top, bottom, and middle, to the extent of at leaſt a third part of the whole covering, and letting them remain ſo, day and night; never ſhutting up for any cauſe but that of too much wet.

The ſecond ſeaſon, obſerve much the ſame regulation as above; and, if fire is applied for the forwarding of the wood, (as hinted in Section VI.) pay due attention at that time, as the ſudden breaking out of the ſun in dull weather, when there is a good deal of fire heat in the houſe, is attended with much danger.

On the ſuppoſition that the plants have made good wood for the production of a crop the third year, and are to be forced from the firſt of March; let the houſe be ſhut up at night from the middle of February, and have the ſame quantity of air admitted in the day it enjoyed all Winter. From the time the fire is lighted, give a moderate quantity, every day, if poſſible, till the buds have all broke, to the extent that in ſun-ſhine the thermometer may not riſe more than 10° above the fire-heat medium: but, after the buds have broke, and the temperature of the houſe is increaſed, be careful in the admiſſion of froſty, or foul damp air. The latter may be entirely excluded, except, perhaps, for an hour or two in the middle of the day; and the bad effects of the former may in ſome meaſure be avoided, by opening the top ſaſhes * *only*, a little way, to paſs off the rarified air occaſioned by the ſun-heat; which is frequently very intenſe in clear froſty weather, in the months of March and April.

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* Few people pay the attention to this article which, in my opinion, it deſerves. I have often ſeen air admitted in a manner as if by mere chance; ſometimes by

In clear ſun-ſhining weather, my practice has been, to give and take away air by degrees; that is, by giving *half air* about eight in the morning, full air about ten or eleven, reducing to half air about two or three, and ſhutting up about four or five in the afternoon, ſooner or later, according to the ſeaſon of the year.

From the time the fruit begins to colour, give large portions of air till the crop is all gathered, the flavour being thereby much enhanced; and afterwards expoſe the houſe night and day for the Winter, as directed

by opening two or three ſaſhes at a place, ſometimes in the middle of the houſe, the top, bottom, or either end, &c. without the leaſt diſcrimination. The air ought to circulate freely in all parts of the houſe. To effect which, it ſhould be admitted at top, bottom, and middle, or at leaſt at top and bottom; dividing it equally in every part of the houſe, according to the quantity to be given: and that too at all times; unleſs the ſeverity of froſt renders it imprudent to do ſo any where but at top, as here directed.

directed above; ſhutting up, however, if much wet, or hard froſt, ſhould happen during the firſt ten or twelve days after the plants have been pruned for the ſeaſon.

SECTION VIII.

On Watering, Waſhing, and Steaming the Grape-Houſe.

THE firſt and ſecond ſeaſons, keep the border in a moderately moiſt ſtate while the plants are growing; but, after their growth begins to abate, (particularly the ſecond ſeaſon), withhold the waterings by degrees, in order to make them harden and ripen their ſhoots for the production of a crop the third year. Water frequently with the drainings of a dunghill; which will be found infinitely ſerviceable, and greatly to promote the growth of the plants. This is a method of manuring, perhaps inferior to none; and, whatever may have been ſaid by theoriſts, reſpecting its tainting the flavour of the fruit, ought not to prevent the practical gardener from applying it in moderate quantities, at any ſeaſon of the year. At a dry time, when the moiſture of the dunghill had been ſuddenly exhaled by the heat of the ſun, I have frequently laid dung *in ſteep* for this purpoſe.

Waſh with the hand-engine twice or thrice a-week in the evening, in order to refreſh and keep the plants clean. Steaming is unneceſſary, unleſs there is fruit in the houſe.

The third ſeaſon, keep the border alſo in a moderately moiſt ſtate, till the fruit begin their laſt ſwelling. Give large quantities of water till they begin to colour: after which, entirely withhold it till the crop is gathered; and then give two or three hearty waterings, in order to recover the ſtate the border ought to remain in for the Winter, which ſhould neither be dry, nor uncomfortably wet.

Waſh twice or thrice a-week, till the flowers begin to open; withhold till the fruit is fairly ſet; waſh again till they begin to colour; and then withhold entirely for the ſeaſon.

Some diſapprove of uſing the engine in the Grape-houſe; but it is equally neceſſary here as in the cherry or peach houſe; nothing being more conducive to the health of the plants, than frequently to ſprinkle their foliage with water. Beſides, by throwing it with ſome force, inſects are thus deſtroyed, and their breeding prevented. By a proper application of the engine, endeavour to render the plants quite clean of inſects, particularly the red ſpider, before the fruit begins to ripen off, as, after this time, it is not adviſable to water the foliage, on a double account, viz. leſt, by moiſture hanging about the cluſters, the berries might rot through damp, and alſo become inſipid in flavour.

In the interim of waſhing, ſteam every night when the fire is at the ſtrongeſt, by pouring * water on the flues till an object cannot be ſeen at the diſtance of two or three yards: and repeat this early in the morning,

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* In another part of this work, I have already hinted, that I do not think it worth the while to erect the ſteaming apparatus for any ſpecies of forcing, except peaches. For the Grape-houſe, it would be extravagant; as ſteam can be produced there at any period of forcing, eſpecially in the flowering ſeaſon, when a ſtrong fire heat is requiſite at any rate.

morning, if the temperature of the houſe ſhould require the making of fires; or if there is a ſufficient heat in the flues to produce ſteam, even in a middling degree.

SECTION IX.

On the Formation, Thinning, and Maturation of the Cluſters.

IN the vaſt variety of Grapes, it happens, that not only the berries, but the bunches, aſſume different forms: and although many kinds, from their nature, require little or no trouble, except thinning, in the formation of handſome cluſters; yet, there are ſome which, from the looſeneſs of their compoſition, require to have their ſhoulders ſupported from the body of the bunch, not only in order to promote the regular ſwelling, but to prevent the rotting of the berries, which otherwiſe frequently happens, if damp weather in the time of ripening.

Amongſt theſe may be reckoned the Syrian, Tokay, Raiſin, Lombardy, Royal Muſcadine, St Peter's, and the Hamburgh;

which, when the berries have arrived at about the ſize of peas, ſhould have their ſhoulders ſupported to the trellis or branches by ſtrands of matting, &c. and, at the ſame time, have their berries regularly thinned out, with ſharp narrow-pointed ſciſſars, to the extent of about one-third of the whole. At this time, alſo, let the other kinds be thinned out in the ſame manner; obſerving to thin out the ſmall, ſeedleſs berries only, of the Sweet Water, Flame-coloured Tokay, and Muſcadine.

If the culture of the grape is attended even with ordinary ſucceſs, it will alſo frequently happen, that many kinds will ſhew more cluſters than, for the future welfare of the plants, ought to be ſuffered to remain on them. In thinning of theſe, no rule can be laid down in caſes unſeen; therefore, in this, as in many others, we muſt confide in the diſcretion of the gardener. But I would beg to remark, that the ſafe ſide of error is, to thin too much rather than too little, eſpecially on young plants.

After the berries begin their laſt ſwelling, and approach to maturity; care muſt be taken to keep the bunch clear of any which, from damp, bruiſes, or the bites of waſps, or any other inſects, may begin to mould, as thereby the whole cluſter will be quickly affected and entirely ſpoiled.

Grapes of all kinds ſhould hang on the tree till dead ripe, particularly the thick-ſkinned ones.

SECTION X.

On the Inſects which infeſt the Grape-Houſe; and how to deſtroy them.

THESE are, the green fly, thrips, red ſpider *, and waſp.

The two firſt are eaſily deſtroyed by a fumigation of tobacco. The third are kept under by the engine in Summer; and effectually deſtroyed, as directed in page 62, in Winter. The laſt, by the deſtruction of their neſts †, phials filled with honey and water, or ſugar and ſmall beer, and birdlime. All theſe methods are, however, ſometimes ineffectual for the deſtruction of waſps, where they abound in vaſt quantity: and their fondneſs for Grapes renders it ſometimes neceſſary to incloſe the bunches in bags of gauze, or ſilken paper, which is truly a misfortune; as the Grapes, by being ſo much excluded from the action of the ſun and air, fall greatly off in flavour.

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* Frontinacs are more ſubject to the red ſpider than moſt other ſorts; and all kinds are more ſo in the pine or dry ſtove, than in the Grape-houſe.

† The moſt effectual method of deſtroying the neſts of waſps is this: Make a ſquib-caſe of cartouch paper, paſteboard, or of a ſtrong ſtem of hemlock; mix up combuſtible matter ſufficient, of gunpowder and ſulphur, to fill

SECTION XI.

On the Prolongation of the Grape Seaſon, where there are more than one compartment for its Culture.

WHERE there are two or three Grape houſes, and a ſucceſſion and fruiting

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fill it in the common manner; but firſt put in as much clean gunpowder as will charge a piſtol; fire the ſquib; thruſt it into the hole of the neſt, and inſtantly cloſe it round with a little mud, previouſly prepared for the purpoſe. When the ſquib burns to the gunpowder, it will explode, and drive the whole ſmoke back to the innermoſt parts of the neſt. In a few minutes, dig it up and each individual, if not already dead, will be found ſo much ſickened as that it cannot eſcape. This operation ſhould be performed after ſun-ſet, when the enemy have returned from their depredations.

pine ſtove, the Grape ſeaſon may be continued from the firſt or middle of March to Chriſtmas; and where there are two or three Grape-houſes only, from the firſt of June in the one caſe, and the middle of April or firſt of May in the other: to effect which, the following methods have been my practice.

For the production of ripe Grapes in March *, I reverſed my ſucceſſion and fruiting ſtoves †; by which means, I had it in my power to force, in ſome meaſure, the vines therein contained: as I found, without doing ſo, I could not bring them in before April or May ‡. In this manner, (and from the way in which the plants were trained), the two ſtoves ſupplied a conſtant ſucceſſion of fruit till the firſt or middle of June. To continue which, I began my firſt Grape-houſe on new-year's day; my ſecond on the firſt of March; and my third, and laſt, I kept as much back as poſſible,

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* I have ſometimes had them in the end of February.

† They were both on one plan.

‡ A more conſtant equality of climate being requiſite in the ſtove than in the Grape-houſe, is obviouſly the cauſe.

poſſible, by expoſing it to the weather night and day till the natural ſeaſon brought the plants into flower.

By this time, it was the firſt of June. I then ſhut up at nights; and encouraged the growth of the plants and fruit, by lighting and continuing the fires the whole ſeaſon; had ripe fruit about the firſt of October, which, by part being hung up in the fruit room, continued till Chriſtmas.

Previous to my introducing Grapes into the pine ſtoves; and in order to have a ſupply of fruit from the month of April to Chriſtmas; I began to force my firſt houſe on the 1ſt of November, my ſecond on the 1ſt of February, and my third I treated in the manner above ſpecified.

The following ſeaſon, I began to force the firſt houſe on the 1ſt of October; and cut grapes on the laſt day of March: but, in the night between that and the 1ſt of April, the front flue burſt; by which accident was loſt the whole foliage, wood, and about five hundred bunches of Grapes juſt coming to maturity. Nothing could be more galling. I inſtantly cut down every new ſhoot *to one eye;* continued the ſame

degree

degree of heat; and gave plenty of air and large quantities of water. The plants made the fineſt wood that ſame ſeaſon; and had the beſt crop of fruit the following, I have ſeen.

The above curious circumſtance I have related, not merely on its own account; but to the end that, were the like happening to any perſon, the plants might not be thrown out in deſpair; which had well nigh been the caſe with theſe. I alſo planted young plants between each of them; but, as the old ones far ſurpaſſed them in vigour before the end of the ſeaſon, I threw them out again.

Let it be here obſerved, that although I found it neceſſary to force the Vines in the ſtoves alternately, by reverſing them from fruiting to ſucceſſion houſes, yet I by no means did, or would adviſe that to be done, with the Grape-houſes. Forcing of any kind is an outrage done to Nature; and the more it is avoided, the greater will be our ſucceſs; and conſequently, the ſame rotation being obſerved, will be the leſs liable to error.

SECTION XII.

On the Cultivation of Grapes in the Pine Stove.

THE cultivation of Grapes in the Pine Stove is in general practice; and the plants are commonly planted on the outſide of the houſe, introduced through holes in the parapet, and trained up the under-ſides of the rafters.

This method I have preſumed to deviate from, for the following reaſons: Firſt, Becauſe I think it unnatural that one part of a plant ſhould be, as it were, in Greenland, and the other in the Weſt Indies; and, Secondly, Becauſe I am convinced that no plant (eſpecially the Pine) will live and thrive *as well* under the ſhade of another, as when expoſed to the free ſun and air. To obviate theſe objections, I planted my Vines in the lobbies between the ſtoves and peach and grape houſes; introduced them through the partitions; and trained them horizontally on trelliſes fixed againſt the back-walls, and upright ſaſhes in front, (See Fig, 2. Plate I.) by which means, each of the ſtoves were rendered equal to any Grape-houſe, without being in the leaſt injurious to the Pines.

The front-walls of the lobbies *, were alſo built on pillars; and a border, both without and within, was prepared for the plants, in the ſame manner as for the Grape-houſe.

The ſecond year after introduction into the ſtove, the plants completely filled the whole trellis; and a fine crop, the third year, gave a luſtre and richneſs to the houſe (in conjunction with a good crop of Pines) highly gratifying.

The ſame methods, in regard to watering, waſhing, and ſteaming, is to be practiſed here as in the Grape-houſe. Air is admitted ſolely for the ſake, and to anſwer the nature, of the Pines; the temperature of the houſe is alſo regulated for their ſakes. But, the mode of training and pruning

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* This method may be practiſed in the ſame manner, where a grape or peach houſe adjoins the ſtove; and where a ſtove ſtands detached, it is cuſtomary, and indeed neceſſary, to build porches with double doors; and, of conſequence, it is eaſy to render them ſubſervient to this purpoſe.

pruning here is very different from that in the Grape-houſe. Here, it is impoſſible to bring on vegetation in that ſlow and regular manner which may be done in the Grape-houſe; and, conſequently, were the ſhoots to be laid in at as great lengths, they would only break, perhaps, a few eyes at the extremities, and the remaining parts would remain naked.

This I found, from experience, to be the caſe; although it did not happen for the firſt three or four years, owing to the youth and vigour of the plants: but, when they had, in ſome meaſure, exhauſted themſelves by bearing a few crops, they began to break their buds in the manner above ſtated. I therefore made it a practice to train them only to five or ſix feet in Summer, and to ſhorten them down to one or two, in the pruning ſeaſon; by which treatment they generally broke all their eyes, and produced plentiful crops of fruit.

In one houſe, I tried, for two ſeaſons, to produce crops *by laterals;* but found that method attended with more inconveniency than the above, from the difficulty of procuring a proper ſucceſſion of ſtrong ſhoots to produce the laterals, without which they bear very inſignificant cluſters.

I alſo, in the other houſe, produced a *ſecond crop*, for two ſeaſons: but, finding it to exhauſt the plants very much, I diſcontinued it; the more eſpecially, as, having ſo many compartments for Grapes, this practice was the leſs neceſſary. The method is this:

Juſt about the time when the fruit is half ripe, and when the under-part of the ſhoot is alſo ripe to the length of about two or three feet, and the extremity of it in a growing ſtate, ſhorten it, at about two or three feet above the ripe part. It will puſh again, and will generally bring two cluſters. Sometimes, alſo, the ſecond and third eyes will puſh, and bring a cluſter or two. In winter pruning, ſhorten down the firſt, or ſpring-made part of the ſhoot, to two or three feet.

This method may be repeated, with pretty good ſucceſs, once in two or three years; but, if done every year, it will (in the courſe of three or four years), occaſion the cutting of the plants down to the ground, in order to make them put forth a freſh ſtock of wood.

In the event of ſevere froſt, and the plants being in an early ſtate of vegetation; let the border, on the outſide, be covered with a quantity of ſtable-dung, or long litter, to prevent the roots from being injured by the weather.

Unleſs the plants are to produce a ſecond crop, they muſt not be pruned for good ſooner than October; and, at the ſame time, that operation ſhould not be deferred longer than the firſt of November, leſt, when they begin to vegetate, they ſhould bleed.

Grafting the Vine is performed with facility; but I do not think it of ſuch conſequence any where as in the ſtove. The method by approach * is certainly to be preferred.

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* The common way of performing this method, is, by growing the young plants or ſcions in a pot, and engrafting the laſt Summer's ſhoot, on the old ſtock, juſt about twenty days before the plant begins to vegetate. But, the moſt ſucceſsful way is, to perform this operation in ſummer, about the time the fruit begins to ripen, in the following manner: Apply the middle of a young ſhoot, whoſe bottom part is beginning to ripen, and the

preferred. The frontinacs, muſcadines, and ſweet-waters, would be greatly improved, and rendered more durable for this compartment, by being engrafted on the Syrian, or any of the other coarſe growing kinds: but the Syrian is the moſt proper for a ſtock, of any.

Grape Vines will bear forcing, and laſt for many years, if under judicious management: but it frequently happens, (eſpecially where the gardener is often changed), that the plants run out of a proper ſtock of bearing wood, either for want of keeping the border in a proper condition in reſpect of trenching and manuring, or by being irregularly and untimouſly forced. To recover which, the plants ſhould be cut down to the laſt eye on the three loweſt ſhoots of the former year, upon each; the roots ſhould be cut to within a yard of the ſtem on each ſide; and the border ſhould be trenched up, and, if neceſſary,

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the extremity in a free, growing ſtate, to the laſt year's wood on the ſtock; bind up with ſtrands of matting; and apply no clay. The young plant will be perfectly ſecure, before the growth is over, the ſame ſeaſon.

ceſſary, renewed, and rendered equal to a new one. See Sect. II. of the preſent Chapter.

The plants will make vigorous roots and branches; and the *third* year afterwards, ill be as good in all reſpects as they were in that of their age.

This is not theory; I have been eye-witneſs to the experiment, which has been crowned with ſucceſs.

CHAP.

CHAPTER VI.

MELONS.

THE cultivation of this much-eſteemed fruit is ſo general, that hardly a garden is to be met with where it is not followed in a greater or leſs degree, and that too with general ſucceſs. As I have been particular on the forcing of cucumbers, as the treatment of theſe and Melons is in many reſpects the ſame; and as I have ſaid much on the culture of the cucumber, which equally applies to that of the Melon, it will be unneceſſary to go through an elaborate repetition here. I ſhall therefore briefly remark any particular difference in their management on the dung hot-bed, and then paſs to the culture of Melons in flued pits.

Let the plants be raiſed in the ſame (or a ſimilar) ſeed-bed as that of the cucumber; let the bed or beds, wherein they are to come to maturity, be made in the ſame manner, and a little ſtronger, turfed all over, the ſame quantity of old tan or light ſandy loam be laid on *, moulded and planted in the ſame manner, have air admitted freely, and kept moderately moiſt till they begin to ſhew fruit. After this, and till the fruit is fairly ſet and begun to ſwell, be ſparing in the waterings, eſpecially in damp weather, and alſo endeavour to keep the bed as free of ſteam as poſſible; ſhorten the vines which have fruit, at two joints above it, and train thoſe that have none, in a regular manner, to the length of ſeven or eight, and then ſtop them, to make them puſh new vines, which will generally ſhow fruit at the ſecond or third joint.

When the fruit is fairly ſet, water freely till they have done ſwelling and begin to ripen, and then be very ſparing, as too much water at this time not only takes greatly

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* One-half ſtrong brown loam, a quarter light black loam, an eighth vegetable mould, and an eighth ſtable-dung, will make an excellent compoſt for Melons; of which quality is that I have uſed for many years, with ſucceſs.

greatly from their flavour, but frequently occaſions the burſting of the fruit, which renders them both unſightly and unfit for carriage. Let a piece of ſlate, tile, or glaſs, be laid under each fruit; it both keeps them from damping and partaking of an earthy flavour.

Some, indeed, ſlate the ſurface all over, and others cover with ſtraw, reeds, moſs, &c.; all which methods I diſapprove. The ſlates being ſo near the glaſs, draw too ſtrong a reflection in hot weather for the plants to bear with patience; and the ſtraw, moſs, &c. contain, and confine too much damp in dull weather; beſides, the ſlates contribute much to the breeding of the red-ſpider *, and the moſs, &c. to the harbouring of beetles, earwigs, &c. which are

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* Melons are very ſubject to this deſtructive inſect in hot weather, which is truly a calamity, as nothing will ſtop its progreſs but water, which at ſome periods of the Melon ſeaſon cannot be applied without doing much miſchief to the fruit; and the leaves and vines being of ſo brittle a nature, they cannot be bruſhed or handled (although ever ſo carefully) without ſuſtaining leſs or more injury. The liquor (See page 62.) is effectually deſtructive of the ſpider, but muſt not be applied to foliage of any kind.

are very deſtructive of the plants and fruit.

As the fruit approach to maturity, keep the plants moderately thin of leaves, none of which ſuffer to ſhade them from the ſun, and give large portions of air, which will add much to their flavour.

Melons ſhould be kept regularly and moderately thin of vines and foliage at all times, ſhould be frequently looked over, and ſhould never be pruned too much at a time, as thereby the plants would be much exhauſted, being apt to bleed at every bruiſe or inciſion.

Melons ſhould be cut the moment they are ripe, otherwiſe they loſe much of their flavour: this, in moſt kinds, is better known by the ſmell than colour of the fruit.

Many of the early kinds, and if early ſown, will produce *a ſecond crop*, equal, both in quantity and quality to the firſt. For this purpoſe, after the firſt crop is all cut, the vines ſhould be ſhortened back to the laſt live-joint on each, the bed ſhould be well-watered, and ſhaded from the mid-day ſun, for eight or ten days; by which time the plants will begin to puſh and ſhow fruit in abundance. Second crops may alſo be obtained by layers; and they will produce very well by cuttings. But in following this latter method, a moderate heat ſhould be prepared, in another bed, wherein to ſtrike and grow the plants.

Melon ſeed ought to be perfectly ripened before ſowing, by being kept in a dry place, or worn in the pocket; but it is ſafeſt not to ſow it till a year old, and it will keep freſh for ſeven or eight. If the ſeed is not perfectly ripened, and ſaved from fruit which is alſo ſo, the plants produced by it will not be fruitful, running much to vines and male-bloom; and any fruit which may be ſhown are apt to drop away.

It is pretty generally underſtood by gardeners, that melons, like moſt exotic annual plants, degenerate, if they are cultivated in the *ſame* ſoil for any conſiderable length of time. Hence it becomes neceſſary, either to change or improve the ſoil, or to exchange the ſeeds. But the value of good kinds, particularly of the early ſorts, when once got and aſcertained, makes the former method preferable to the latter.

At one time, the idea occurred to me, that were the ſeeds of Melons laid by for a time, to ſow them afterwards in the ſame garden might anſwer the purpoſe here in view. Accordingly, I laid aſide, for three years, a part of each kind of my choiceſt ſorts. I then ſowed them, and they were evidently improved in quality; which I can account for in no other way, than that in the courſe of this time, I was at much pains and trouble to improve my Melon-mould. Perhaps, however, the ſeeds might have been partly improved by age.

I come now to the culture of Melons in flued pits. (See Fig. 1. Plate I.) I have already ſaid, that I do not think theſe pits ſo eligible for the production of Melons at an early ſeaſon, as the dung hot-bed, and in page 26. have given my reaſons. I will therefore ſuppoſe that the pit was alſo built for other purpoſes, is employed in the ſpring in forcing aſparagus, &c., and is to be employed in producing a late crop of Melons.

The firſt or middle of June will be ſoon enough to plant *; and at this ſeaſon a very moderate degree of bottom heat will be ſufficient; whatever articles the pit has previouſly produced will have been forced on tan or dung, which will alſo now be much exhauſted. Let the heat, therefore, be renewed, by adding and mixing about one-third of new, with the old tan or dung; level it to the bottom of the flues all around; turfing will be unneceſſary; *mould* to the depth of fifteen inches, which will raiſe the whole ſurface to the height of the top of the flues; and by the tan or dung ſubſiding, will again be level with their bottoms before fire heat is neceſſary. Place the plants in a row along the middle of the pit, at the diſtance of two feet from each other; and attend to them in the articles of water, air, pruning, impregnating †, &c., in all other reſpects as directed for the dung hot-bed, and according to the nature of the ſeaſon, and ſtate of the weather, till the firſt or middle of September; and by that time it will generally be neceſſary to apply fire heat, both on account of cold and damp, which then begin to be conſiderable.

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* The plants may be raiſed in a hot-bed, or under hand or bell glaſſes. I ſay nothing of the kinds; every gardener has his favourites, and will judge for himſelf.

† It is even more neceſſary to *impregnate* Melons than cucumbers, for this plain reaſon: The fruit of the cucumber is uſed green, and before it be matured; whereas

The fruit by this time will be far advanced, ſome of which will be approaching to maturity; and for the maturation and production of the reſt in a tolerable degree of perfection and flavour, let ſlow fires be made in the evenings, increaſing as the ſeaſon advances, ſo as to raiſe the air of the pit at eight at night, and eight in the morning, to about 70 degrees.

Air is eſſential to the flavour of the fruit; and that it may be admitted in tolerable

whereas that of the Melon, except for pickling, is uſeleſs and nauſeous, until it be perfectly ripe. Now, it has been aſcertained, that the fruit of the cucumber may be produced of a ſize fit for the table, although every male-bloom were deſtroyed at its firſt appearance, and conſequently, the embryo fruit were not impregnated. But I have not yet been able, either by actual experiment or otherwiſe, to learn, that a Melon (except of one variety, a ſub-hermaphrodite) could be produced in perfection without being *impregnated.*

lerable quantity, and at the ſame time that the heat may be kept up in dull weather, let a little fire be made in the mornings. Water muſt be uſed with caution; the growth of the plants will now be over; and when the fruit hath arrived to its full ſize, watering ſhould be entirely diſcontinued.

CHAPTER VII.

MUSHROOMS.

SECTION I.

On the Conſtruction of the Muſhroom-Houſe.

THIS vegetable is much in requeſt in many families at all times of the year; and ſome have compartments built ſolely for its production; but it is generally produced in the back ſheds of hot-houſes or green-houſes, cellars, ends of ſtables, &c. and ſometimes on beds built in the open air, and protected by coverings of ſtraw or other litter. This laſt is attended with much inconvenience, not only on account of the difficulty of effectually ſheltering the bed from the inclemency of the weather in Winter, but that in covering and uncovering at the time of gathering the crop, many of the young ones, which are juſt peeping through the ſurface are unavoidably deſtroyed.

Little light or air (except when the bed is in preparation) being eſſential to the production of muſhrooms, they may be raiſed as ſucceſsfully in the back-ſhed, ſtable, or cellar, as in any other way; but where they are required at all times of the year, a compartment where fire-heat may be commanded is indiſpenſably neceſſary. Fig. 2. Plate IV. repreſents the plan of a muſhroom-houſe, wrought by one fire, and divided for the purpoſe of producing them in ſucceſſion, on a conſtruction that has given much ſatisfaction for many years. It is of little conſequence in what ſituation it is placed, provided the bottom be dry; and the roof may either be of ſlate, tile, or of thatch.

Where there is neither ſhed nor ſtable, &c. rather than make up the bed in the open air, and be under the inconvenient neceſſity of covering the ſurface with ſtraw, &c. let a frame in form of the roof of a houſe compoſed of half-inch boards, be made to any convenient length, and to the width of ſix feet at bottom: This two people can lift off and on at pleaſure; and in the ſeverity of Winter it can be covered with litter, &c. to prevent the froſt from deſtroying the plants or ſpawn. The boards ſhould be imbricated and well painted or laid over with pitch, to prevent the wet from penetrating; and a trench ſhould alſo be dug all round the bed, to keep its bottom dry. Boards ſhould alſo be made, at two or three different places, to ſlip for the admiſſion of air, when required.

SECTION II.

On Preparing the Muſhroom-Beds.

BECAUSE the ſeeds of Muſhrooms have not yet been diſcovered, ſome are doubtful whether there be really any ſuch thing; and not a few are of opinion, that this, and many other plants, are produced ſpontaneouſly without ſeeds. Mr Berkeley ſays, "The extremely ſmall ſeeds "of fern, moſſes, muſhrooms, and ſome other "plants, are concealed and wafted about "in the air, every part whereof ſeems re-"plete with ſeeds of one kind or other."

And Mr Switzer, an advocate for the idea of ſpontaneous productions, ſeems to be of opinion, that ſome plants are produced from juices, lodged originally in the ground.

Be this as it may, we know that the Muſhroom may be produced from ſpawn; and alſo without any certain viſible ingredient, or origin, from whence it doth ſpring. The former, being the moſt natural, has hitherto been the moſt common method; but of late years, even making, or, as it may be ſaid, creating Muſhroom-ſpawn, has become a branch of trade with ſome.

According to my mode, the production of the Muſhroom depends almoſt ſolely on the preparation of the bed. Some pay little attention to this matter; and where ſpawning is uniformly practiſed, the leſs is neceſſary: but I prefer the method of making the bed a whole maſs of ſpawn.

It may be objected, that this method is dilatory: This I grant is the caſe: but if the bed is duly prepared, the time of cutting may be reckoned upon with equal, if not greater certainty, although at a greater er diſtance; and of what conſequence is that? it only requires beginning the ſooner to prepare the bed. Beds that are built and ſpawned in the common way ſeldom produce above three or four months together: I have frequently had them producing the year round in great abuudance; and I once had a bed which produced two complete years, and in ſuch quantities, that beſides generally yielding a diſh every day, ſeveral gallons of ketchup were made from it. However, Muſhroom-beds of all kinds are ſubject to many misfortunes, and the ſpawn is of ſo delicate a nature, that it is quickly deſtroyed by too much cold, heat, drought, or wet.

My mode of preparing the bed is this: I firſt lay about a foot of furnace-aſhes, brick-batts, or ſtone-chips, for a bottom; then ſix inches of horſe-droppings *, taken carefully from the ſtable every morning, and kept as whole as poſſible: Theſe I ſuffer

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* I have found, that the richer the feeding of the animal, the more productive are their droppings; and therefore prefer the droppings of coach or hunting horſes to thoſe of the farm. It may be worthy of notice, that ſtone-horſe droppings are the moſt productive of any.

fer not in any wiſe to heat; and the whole time the bed is in preparation, I expoſe it to all the air in my power, provided it be not damp. After this courſe has lain ten or twelve days, is quite dry, and there is no apprehenſion of its fermenting, let it be covered to the thickneſs of two inches, with half vegetable mould of decayed tree-leaves, and half light, ſandy loam, which ſhould be well mixed together previouſly. But indeed, light, rich, dry mould of any kind will anſwer; being of no other uſe than for the ſpawn to run in. Lay on another courſe of droppings in the ſame manner; and when it is alſo perfectly dry, and paſt fermentation, cover it with the ſame mould, as above. Lay a third courſe of droppings and mould, in the ſame manner, which finiſhes the bed. In the making, the bed ſhould be gently rounded in the middle (eſpecially if it is placed out of doors) to run off the wet.

Thus the bed will generally be a month or five weeks in making, and in as much more will begin to produce, unleſs the weather or ſtate of the droppings has been unfavourable.

It is obvious, that from the above mode of proceeding, a whole courſe of droppings cannot be laid on at once, unleſs where there are a great many horſes kept, or the bed is but of trifling dimenſions; therefore, when the laſt end of the bed is covered, proceed with the firſt, if fit, a ſecond time, &c. previouſly covering with mould.

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SECTION III.

On the Temperature of the Muſhroom-Houſe.

IT muſt here be underſtood of ſuch as is repreſented by Fig. 2. Plate IV. or of one where fire heat is requiſite, and at command. I have found that Muſhroom-beds produce beſt in a conſtant heat of about 55 degrees; and the more regular it is kept, the greater will be the ſucceſs. Air is of little importance, unleſs to dry off damp.

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SECTION IV.

On Watering the Muſhroom-Beds.

THIS muſt, at all times, be moderately and regularly performed; but it will generally be unneceſſary to apply water before

fore the bed begins to produce, as the moiſture of the droppings is uſually ſufficient till that time. Let this be cautiouſly performed at firſt, until the bed attain to a proper conſiſtency, and then with a little more freedom. As much water as will fairly wet the ſurface, once in three days, will generally be found to be ſufficient. But it is ſafer to give too little than too much water, particularly in damp weather.

SECTION V.

On the Prolongation of the Muſhroom-Seaſon.

IN moſt places the open fields ſupply them for two or three months in Summer; yet in very wet ſeaſons they are rarely to be found, if the ſoil be not of a dry nature: therefore, where there are two or three places appropriated to their production, and where they are in requeſt at all times, it might be adviſable to have little dependence on the fields, reſerving the produce of theſe for ketchup, and preparing beds in conſtant ſucceſſion to ſupply the kitchen.

For this purpoſe, the compartment where fire heat is at command, ſhould always be appropriated to the Winter-beds, and the the ſheds; &c. to the Summer ones.

In gathering the crop, care ſhould be taken not to pull up or diſturb the roots of thoſe that are cut, as there are generally many young ones adhering to, or riſing about them. Muſhrooms alſo frequently form, come to maturity, and die away entirely under ground in theſe beds, if ſuffered; but they are eaſily recogniſed, as they are generally very large, and puſh up little hills like thoſe of moles, above their heads. Diſcovering and cutting theſe ſhould be performed with care, that the ſpawn may not be injured.

CHAPTER VIII.

PEACHES AND NECTARINES.

SECTION I.

On the Conſtruction of the Peach-Houſe.

THE conſtruction of the compartments for forcing this much-admired and juſtly-eſteemed fruit, vary yet more than that of the grape-houſe; and what I have advanced in the firſt Section of the Chapter on Grapes, will equally apply here. But there are ſome kinds of compartments for the cultivation of peaches in uſe, which I diſapprove of, and would wiſh to point out. Theſe are, oiled-paper frames, and frames placed againſt flued walls, without front flues. I object to the firſt, on account of its darkneſs, and incapability of admitting the rays of light, and free air; both of which are ſo indiſpenſably neceſſary to the health and vigour of the trees:—to the ſecond, becauſe the front is the moſt valuable flue in any houſe; both on account of the ſaving of fuel from the circumſtance of its having a greater command on the temperature, (all rarified air aſcending), and on account of the injury done the trees by the violent heat of the back flues in keeping up the temperature of the houſe, in ſtormy weather; beſides, the propenſity of inſects to harbour and breed between the trellis and flue, in theſe circumſtances.

Fig. 2. Plate II. repreſents the plan of an approved Peach-houſe, wrought by one fire, which communicates firſt with the front flue, and returns in the back; and, in my opinion, is beſt adapted of any to early forcing. The trees are planted near to the front-wall, and trained to a trellis that covers the whole roof,—an approved method, of which ſee more in Sect. II. of Chap. XII.

Fig. 1. Plate III. is alſo on a conſtruction that is perfectly adapted to the cultivation of Peaches. But, as this plan is given purpoſely for grapes, it may be neceſſary to remark, that the two fires are capable of working to an extent of ten feet more in length, if for a Peach-houſe; and

alſo, that, as the border for the Peach-houſe is to be only three feet deep, it will be unneceſſary to found the pillars, which ſupport the front wall and flues, any deeper than three feet and a half.

In a houſe of this kind, a trellis is to be fixed againſt the roof-beams or rafters, to the extent of half their height; trees planted between the front flue and wall, and trained thereto. Theſe will in nowiſe ſhade thoſe on the back. And thus will one houſe be rendered nearly equal to two, as the trees on the front will have a run of eleven or twelve feet.

I conceive this mode to be preferable to the common practice of planting grape-vines to run up the rafters in the Peach-houſe; firſt, becauſe, by the vines, the Peaches are generally much ſhaded; ſecondly, the ſoil for Peaches, and the ſoil for grapes, ſhould be formed of different materials, and of different depths; and, thirdly, it is ſimply impoſſible to make and regulate a climate in one and the ſame houſe to ſuit both the plants in queſtion. Of this the reader may be farther convinced by carefully peruſing and comparing the Sections on the preparation of the borders, the temperature, and admiſſion of air, for the Grape and Peach houſes.

* * *

SECTION II.

On the Situation and Preparation of the Border.

WHAT I have ſaid in Section II. Chap. V. on the cultivation of the grape, in regard to the ſituation of the border, equally applies here, both in reſpect to the good and the bad; a repetition of which is unneceſſary. I will therefore paſs to the compoſition, breadth and depth.

Three fourths ſtrong brown loam, an eighth light ſandy loam, and an eighth ſtable-dung, with about a fortieth part of ſhell-marl, was the compoſition of the Peach borders at Wemyſs Caſtle; all of which were made completely three feet deep. The breadth for the narrow houſe, is fourteen feet from the back-wall; and, for the wide one, all the width of the houſe within, and to the extent of twelve feet without.

It may be unneceſſary to ſay, that the compoſt is to be well prepared for the plants, by trenching and mixing it thoroughly, and rendering it into a maſs perfectly homogeneous. The neceſſity of this, in all compoſt preparations, is evident, and ought to be the chief butt of our aim, next to that of fixing on proper materials.

As before hinted, I would not wiſh to ſay that this compoſition *only* is fitted for Peaches: it may be varied; it may be made ſtronger, lighter, richer, or poorer, according to circumſtances, and the judgment of the gardener. But I would remark, and obſervation and experience juſtify it, that the above may with propriety be deemed a good medium.

For particulars, reſpecting the annual management of the ſurface, &c. ſee the latter part of the ſecond Section on the Grape.

SECTION III.

On Planting, and the Kinds beſt adapted to the Peach-Houſe.

MAIDEN, or one-year-trained trees, are to be preferred to any other. Riders of the ſame age ſhould be planted between the dwarfs; except on the front of the large houſe, where they would not have time to do any good before their removal would become neceſſary. From twelve to fifteen feet, according as the length of the houſe will beſt divide, is a competent diſtance between the dwarfs. The ſeaſon is, any time from the firſt of November to the firſt of March. Fill in the pits with light rich compoſt, and ſettle the roots with a little water.

The following is a liſt of Peaches and Nectarines; out of which, thoſe marked thus * ought to be preferred. But even this is diſcretionary, and every one has a right to indulge his own fancy, whether in reſpect to the choice or amplitude of his collection.

Peaches.

Mignionette.
*Red Magdalen.
*White do.
*Royal George.
*Grimwood's do.
*Nobleſſe.
Chancellor.
Belle Cheveraux.
*French Minion.
Early Newington.
*Smith's do.
*Montaubon.
*Tetton de Venus.
*Early Purple.

Peaches.

*Late Purple.
*Orange †.
Ramboulliet.
Hatiye.

Nectarines.

*Roman.
*Scarlet.
*Elruge.
*Newington.
*Temple.
*Duc de Tello ‡.
*Murray.
*Brunion.

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† This fruit, when ripe, is the moſt elegant of any of the Peach kind; is a great bearer, a cling-ſtone, and of theſe the beſt flavoured I know.

‡ This is a Spaniſh Nectarine; and, of all others, ought to take preference. The fruit is of the moſt exquiſite flavour, dark purple, a free-ſtone; and generally grows to the ſize of a nobleſſe Peach.

SECTION IV.

On Training and Pruning.*

FAN-training is the only way in which Peaches will do well. Therefore, after planting, and to make the trees put forth vigorouſly and fill the trellis from the bottom, (I ſpeak of the dwarfs), head them down to two or three eyes on each ſhoot, if maiden, and to the laſt eye on each branch, if one-year-trained trees.

The riders being temporary, and placed here only for the purpoſe of obtain-

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* Much has been ſaid, of late, reſpecting training on horizontal trelliſes; and ſome have even been at the trouble of erecting them in a manner whereby (by the uſe of ropes and pullies) they can depreſs or elevate them at pleaſure. This, I confeſs, is both minute and reaſonable, where it can be practiſed. But I am inclined to think that it cannot eaſily be done without ſtraining the tree in the movement; and it is obvious that it cannot be done by any but a ſmall trellis placed in the middle of the houſe. After all, the production of well-flavoured fruit depends much more on the judicious management throughout, than on what poſition the trellis be.

ing a crop or two while the principals are filling their ſpaces, need not be ſhortened ſo much, whether maiden or trained trees. This will make them puſh more moderate ſhoots, and bring them ſooner into a bearing ſtate; which object muſt always be kept in view while they remain here. And, as the treatment of them will, in all other reſpects, be the ſame as that of the principals, I ſhall take no farther notice of them; leaving the thinning away, and final expulſion of them, to the prudence of the gardener.

When the ſhoots have arrived to the length of two or three inches, rub off ſuch as are placed fore-right or back-right, and lay in the others as they advance, at the diſtance of nine or ten inches; being careful not to bundle in the leaves with the tie, and to allow ſufficient room for the ſwelling of the ſhoot: and pinch off all laterals as they appear. When their growth is ſtopt for the ſeaſon, cut them back from one-half to a third of their lengths, according to their ſtrength; and, in dreſſing, bear the ſide ones well down, to fill the bottom part of the trellis.

Next ſeaſon they will puſh vigorouſly, and muſt be laid in at the above diſtances; obſerving to lay in the undermoſt ſhoot on each branch to furniſh the under part of the tree, and the uppermoſt for a leader: rubbing off all the intermediate ones, unleſs wanted; but at any rate the fore-right ones, as theſe greatly deform the tree. At the end of the ſeaſon, leave them generally at three fourths of their whole length.

If the wood has been well ripened this ſeaſon, the trees will bear a few fruit the following. But, unleſs the trees are very vigorous, a few only ſhould be ſuffered; paying reſpect rather to the furniſhing of the trellis for a crop the fourth ſeaſon, which may reaſonably be expected.

For this purpoſe, lay in the ſummer ſhoots regularly, at the diſtance of ſix inches, which forthwith muſt be reckoned the medium; and, in the winter pruning, ſhorten the ſhoots of the extremity of the tree *only* a few inches each, and lay in thoſe of the middle at full length. Obſerve this practice till the trees have filled their places; and afterwards ſhorten en none, unleſs to fill any caſual vacancy, or in caſe of the extremities of the ſhoots being injured by bruiſes, &c.

It is a common practice to ſhorten every ſhoot leſs or more. This may be proper, in many inſtances, on peaches growing in the open air, as when the extremities of the ſhoots have not been fully ripened, and are injured by froſt; but it can only be ſo far proper in the Peach-houſe, as to cauſe the plant puſh ſhoots to fill a vacancy, or to keep the bottom part of the trellis furniſhed with a ſupply of young wood.

Peach-trees require to be frequently looked over in Summer; and diveſted of laterals, and water-ſhoots from the old wood, where not requiſite; being kept regularly thin, and neatly dreſſed to the trellis, &c. In tying, however, be careful not to tie too near to the point of the ſhoot; leaving always a few joints between the laſt tie and extremity: alſo, be careful not to bundle in the leaves with the tie.

About the time the fruit is fairly ſet, is that for *diſbudding:* and this operation is to be performed with great care and nicety. Select what buds on each ſhoot it may be thought neceſſary to leave, and rub off the reſt with the finger. Thoſe to be left are generally the uppermoſt and undermoſt, and ſometimes one or two about the middle of the ſhoot; which laſt ſhould be left in an alternate manner. A wood-bud is frequently placed by the ſide of, or between two fruit; in diſplacing of which, be careful not to injure them.

By the timely performance of this duty, much future trouble in pruning may be ſpared; and much better, and more vigorous ſhoots for the production of a crop the following ſeaſon may be obtained, than when the ſtrength of the tree is exhauſted in the produce of ſuperfluous growth, afterwards to be deſtroyed.

When the fruit begins their laſt ſwelling, let them be expoſed to the free action of the ſun and air, by picking off every leaf that overhangs them. And, when the leaves begin to drop, aid this effort of nature by ſwitching off the leaves *gently*, from time to time: an operation more neceſſary here than on the common wall, on account that the wind is not ſo much helping to this effect.

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SECTION V.

On the Temperature of the Peach-Houſe.

FIRE heat ſhould not be applied ſooner than the third ſeaſon; and then only to ripen the wood, in the Autumn, (if neceſſary), for the better production of a crop the fourth year. But as, even the fourth ſeaſon, the trees will bear but very gentle forcing, and as I wiſh to be particular on this head; I ſhall wave the farther conſideration of the temperature of the houſe to the fifth ſeaſon, and ſhall then ſuppoſe the forcing is to be commenced on the 1ſt of February.

Let the fire be made ſo moderate the firſt fortnight, that the thermometer may not ſtand at eight at night, and ſeven in the morning, above 45°; and, in the courſe of the ſecond fortnight, increaſe to 50°; afterwards *gradually* to 55°; at which point endeavour to keep it till the ſtoning is fairly over, and then increaſe to 60°; and, towards the fruit's ripening, to 65°; which it ſhould never paſs, on account of drawing the young ſhoots up weak.

It is hoped theſe rules may ſuffice for the regulation of fire heat, although the forcing were begun ſooner in the ſeaſon. In this caſe, however, much caution is neceſſary in the proceſs, that by an *over-heat* at an early period of the year, the plants may not be injured. Indeed, in the whole progreſs of the application of fire heat, the greateſt regularity and ſteadineſs ſhould be obſerved; as theſe trees are impatient of ſudden checks of any kind, eſpecially in the time of ſetting and ſtoning.

SECTION VI.

On the Admiſſion of Air to the Peach-Houſe.

FROM the time the trees are planted, a large and free circulation ſhould be encouraged every day, from ſun-riſe to ſun-ſet, the whole of the firſt ſeaſon; and, when the growth is ſtopt, and the wood ripe, let the houſe be expoſed in the ſame manner as directed for the grape-houſe, in the Section on air, page 106. The ſecond ſeaſon, the houſe may be ſhut up at night from the 1ſt of March, and afterwards treated as above; and ſo of the following.

I come now to the fifth, or ſeaſon of forcing. Let the houſe be ſhut up at night from the middle of January, and enjoy a large and free circulation through the day till the 1ſt of February; and then, in a more moderate degree, according to the weather, and paying reſpect to the temperature of the houſe, till the bloom begins to open. After this time, leſs or more air muſt be admitted every day, if poſſible; as the ſetting of the fruit, in a kindly manner, depends much on wholeſome air, and a free circulation. In ſun-ſhine, let it be admitted at this time to the extent that the thermometer may not ſtand at more than five or ſix degrees above the fire-heat medium; and at no time, till the ſtoning is over, above ten degrees; but afterwards, in the middle of the day, it may be ſuffered to riſe to the height of fifteen.

When the fruit begins to colour, the houſe ſhould be opened by ſun-riſe, and ſhould not be ſhut till ſun-ſet, unleſs to defend the fruit from heavy rains; paying little reſpect to ſunſhine at this time: air being as eſſential to the flavour of the fruit, as the rays of the ſun; and the more ſo, when theſe are excluded.

After the crop is all gathered, let the houſe be expoſed for the Winter, as before.

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SECTION VII.

On Watering, Waſhing, and Steaming the Peach-Houſe.

PEACHES, when in a growing ſtate, require plentiful waterings; and the border ſhould always be kept in a moderately moiſt condition: withholding a little in the time of ſetting and ſtoning, and totally from the time the fruit begins to colour. After the crop is gathered, give a few hearty waterings, to bring the border into a proper ſtate for the Winter.

Waſh thrice a-week, with the hand-engine, from the commencement of the forcing, till the flowers begin to open; withhold
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SECTION VIII.

On Thinning and Gathering the Fruit.

THINNING is an indiſpenſable duty; as there are many kinds of Peaches and Nectarines which otherwiſe would ſoon bear themſelves to death. This operation, however, ſhould be performed with caution, and never done for good till after the ſtoning is over; as, till then, all danger of dropping is not paſt.

My rule for thinning is this:—A fruit for every foot ſquare of the ſurface of the tree for the large kinds, and for every nine or ten inches of the ſmall kinds of Peaches, and Nectarines in general. This muſt be underſtood as for trees in a healthy and vigorous ſtate; but, when otherwiſe, they ſhould only be ſuffered to produce accordingly. As an inſtance:—I once had an Elruge Nectarine, a great bearer, which had a tendency to grow naked of ſhoots below; I pulled off every fruit within ſix or eight feet of the ground one ſeaſon, and it made excellent wood in that part in conſequence.

So that, it would appear, it were well to be contented with a fair crop; which is better, in the end, both for the tree and its owner.

But, certainly, nothing can be more cenſurable than the practice of thoſe who negligently ſuffer every fruit the tree may ſet, to remain on it; evidently to the injury of the whole crop, and ultimately to the ruin of the plant. And, of what value or flavour are this multitude of *nutmegs*, compared with the graceful appearance and reliſh of well-ſized fruit?

It is cuſtomary to let the fruit drop of its own accord, when ripe; and, for this purpoſe, the border is covered with moſs, and nets or mats are hung againſt the trellis to catch them. I have ever been of opinion, that all kinds of fruits, except grapes, loſe much of their flavour if they are ſuffered to remain on the plant till dead ripe; and, in conformity thereto, have made it a practice to pull my Peaches and Nectarines.

I have often been aſked, how I came to know when they are fit for pulling? (as handling or feeling them is improper).

This is only attained to by minute obſervation and cuſtom, and a thorough acquaintance of the kinds; and, if taking them gently between two fingers, the back of the hand to the tree, and moving them backwards and forwards, does not diſplace thoſe ſuſpected to be ripe, paſs by them till next day. In this manner, let the trellis be gone over each morning, and good account will be found in the practice; as not the one-half are loſt or bruiſed, which are, when ſuffered to fall; and the fruit, not being dead ripe, are much fitter for carriage, if requiſite. This practice I would recommend alſo, on account that the border, when covered with moſs, emits a bad flavour; and nothing is more conducive to a good one, than the ſurface being kept clean, and being frequently ſtirred up while the fruit are ripening.

SECTION IX.

On the Inſects that infeſt the Peach-Houſe, and how to deſtroy them.

THESE are, the aphis, the acarus, and the cocci, or ſcaly inſect; to which may be added, although not an inſect, that more deadly malady, the mildew.

In treating of this article in the third and fourth Chapters of this work, I have given ample directions for the ſuppreſſion and extirpation of the inſects; but the mildew remains to be conſidered.

It is evidently an itch or ſcurvy in the blood of the tree; occaſioned by injudicious management in the culture, a damp ſituation, or cankering ſoil. And although I cannot ſay that I ever had it in my power to try experiments for its deſtruction, (having never been troubled with it); yet I have endeavoured, and I think ſucceſsfully, to prevent its appearance, and that by preparing good and kindly ſoil for the trees, and paying all due attention to their health and cleanlineſs. I am alſo confident that the waſhing with the liquor

(See page 62.) has much tended to its ſuppreſſion.

But, after all, if the border has not been compoſed of proper materials, and rendered perfectly dry and comfortable in the preparation, much fear of its appearance may reaſonably be entertained. Hence it may juſtly be ſaid, that the beſt cure for this malady lies in the prevention of it.

SECTION X.

On the Prolongation of the Peach-Seaſon, where there is more than one Compartment for its Culture.

WHERE there are two Peach-houſes, and a few trees planted againſt the open wall in a ſouth aſpect, the ſeaſon may be prolonged from the firſt or middle of June, to the firſt of November, in conſtant ſucceſſion, by beginning to force the firſt houſe on the firſt of February, and the ſecond about the middle or latter end of March. But where there are three or four * houſes, and a flued wall, the ſeaſon may be ſucceſsfully prolonged from the firſt of May to the firſt or middle of November.

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* At Wemyſs Caſtle, there were three narrow houſes, a large double houſe, and an extenſive flued wall, for which

My mode was this: I began to force my firſt houſe on the firſt of December, and as it was not much to be depended on at that early ſeaſon, my ſecond on the firſt of January; my third on the firſt of March; and the fourth, I let come of its own accord, without the aid of any fire heat. I never applied fire to the flued wall until the firſt or middle of Auguſt, and that in order to ripen the wood, and haſten the maturity of the late fruit.

I did not reverſe the ſucceſſive order of the Peach-houſes, and conſequently they were always ready to vegetate at the ſame time of year, on the application of the fire heat, much leſs to their detriment, in my opinion, than had they been changed in the order of ſucceſſion.

I would here obſerve, that Peach-trees, if forced every year, will wear out in the courſe of twelve or fourteen; and, therefore, about the eight or tenth year, young dwarfs

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which there were canvas ſcreens; alſo a few trees on the common wall.

dwarfs ſhould be planted where the riders ſtood, and the old dwarfs ſhould be converted into riders by degrees as the young ones advance.

The Peach-ſeaſon might be further prolonged by cultivating a few dwarfs in pots or boxes, in the ſame manner as is hinted for cherries, Chap. III. Sect. VIII. In this manner, I have witneſſed the ſeaſon of this fruit being ſo far changed, as that ripe Peaches were produced about Chriſtmas * !

SECTION XI.

On the Cultivation of Peaches and Nectarines on Flued Walls, with Canvas Screens, Nets, &c.

IT may be ſaid that flued walls are eſſential to the production of Peaches and Nectarines in the open air, in the more northern parts of this country, although there are ſome ſpots, and in ſome ſituations, where good crops in *ſome* ſeaſons are obtained without them; but to their production to a certainty, year by year, flued walls are indiſpenſably neceſſary; and where a fine garden is building, the extra expence in flueing two or three hundred feet of the beſt expoſed walls, will be found but trifling. If built according to the deſign, (See Fig. 1. Plate IV.) and worked according to my method as under, the annual expence will alſo be trifling.

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* By Mr Black, gardener at Mordun, near Edinburgh, in 1797-8.

For ſecuring the crop in the Spring, by defending the bloom till fairly ſet, from the froſty winds which ſo frequently happen at that ſeaſon, canvas ſcreens or old nets are neceſſary; but the canvas is far preferable, and in the end, little more expenſive than the nets.—There is a kind of thin canvas called Scrim or Oſnaburgh, which anſwers very well, and is ſold at about ninepence the ſquare yard.

But for the flued wall at Wemyſs Caſtle, I had canvas wove on purpoſe, much thinner than any other I have ſeen, which now, by the action of the weather, is rendered as fine as gauze in compariſon; and which, in 1790, coſt but eightpence a yard. As much as covers a wall two hundred feet long and fourteen high, coſt only about fifteen guineas, including ſpars, cords, and pullies.

The manner in which it was applied is this: The canvas was made into three equal ſheets, which were joined together every ſeaſon when put on, and unjoined when laid aſide; ſpars or rafters of two inches ſquare were placed at the diſtance of four feet from each other, their upper ends being joined cloſe to the copping, and their under ends to a ſtake drove into the border, at the diſtance of a foot from the wall. Theſe were alſo made to remove at pleaſure; pullies were fixed to the top of each ſpar, and the canvas hoiſted thereto by cords a little ſtronger than garden line. At firſt I clewed it at top; but, a ſtrong gale of wind having almoſt tore it from the wall, I contrived to clew it at bottom, at the diſtance of a foot from the ground. Two people can unclew and hoiſt, or let down and clew, the whole in fifteen minutes.

When nets are to be uſed, they ſhould be doubled, in ſuch a manner as to render the meſhes as ſmall as poſſible; and ſhould be ſupported from the wall about a foot by hooked pegs. It is common to hang theſe on in a random manner, but this does not at all anſwer the purpoſe intended; which is rather to break the force of the wind, than to prevent froſt. By being placed out, at a diſtance from the wall, and being doubled as above, the froſty winds are broke ere they reach the tender bloom; and every gardener of penetration will admit, that winds of this deſcription are more baneful than even hard froſts.

As, in the preceding Sections, I have given ample directions for preparing the border, planting [*], training, watering, waſhing, &c. it would be futile to repeat them here; and as it may be preſumed the trees will produce no very conſiderable crop before the fourth ſeaſon, I will paſs on to that time.

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[*] Before planting, there ſhould be a trellis, or ſpars an inch ſquare, fixed againſt the wall, to the height of the firſt courſe of the flue only; this being requiſite to keep the young ſhoots from being ſcorched or anywiſe injured by the fire heat: and by the time it has returned into the ſecond flue, the trees may be dreſſed to the wall without danger.

Some apply fire heat to their flued walls in the Spring. This I pointedly diſapprove of, as no ſpecies of forcing is ſo intricate; the trees being placed between the extremes of heat and cold, and it being quite impoſſible to make or regulate a climate for them. All that is neceſſary for the production of a crop, is, ripening and hardening the wood in Autumn, and ſcreening from froſty and boiſterous winds in Spring.

By the time the buds begin to appear turgid in the Spring, let the ſcreens be hung up: and, if canvas, let them down in the day, from eight in the morning to five or ſix in the afternoon, in mild weather; but if boiſterous froſty winds prevail, continue them all day. They ſhould not be totally removed till about the middle of June; by which time the fruit will be fairly ſet, and all danger will be paſt.

About the firſt or middle of Auguſt, according to the ſeaſon and forwardneſs of the fruit and wood, light the fires. Theſe muſt be made very moderate at firſt, and increaſed as the ſeaſon advances. If the ſurface of the wall, about the ſecond courſe of the flue, is kept milk-warm in the night, it is all that is neceſſary. And here obſerve,

ſerve, that the quantity of fuel muſt not be enlarged in a ſtormy night in the ſame degree as in a hot-houſe; otherwiſe, all will be ruined. To attempt making a climate for the trees here is ridiculous, and alſo perfectly unneceſſary; the ſole intention in the application of fire, being to ripen the young ſhoots for the production of fruit next ſeaſon.

The following quantity and proportion of ſmall coal is taken at a medium, and what I have found ſufficient to work a well-drawing furnace for years, viz. From the time of lighting the fire to about the 10th of September, four ordinary ſhovels-full at five, and as much at nine in the evening; from the 10th of September to the middle of October, ſix ſhovels-full at the above times in the evening; and from the middle of October to the middle of November, ſix ſhovels-full at four in the evening, eight ſhovels-full at nine, and three or four at ſeven in the morning.

The above is only given as a hint; and much is left to the nature of the ſeaſon, and judgment of the operator. But much care, in this ſpecies of forcing, is indiſpenſably neceſſary to the inſurance of ſucceſs.

CHAPTER IX.

PINES.

SECTION I.

On the Conſtruction of the Pinery.

THAT few thoroughly underſtand the cultivation of this moſt admirable fruit, is demonſtrated by its being diſcontinued in many places where it has been tried for years. Some have alſo given up the cultivation of Pines, becauſe of the expence attending it in reſpect of fuel: the waſte of which is greatly occaſioned by the conſtruction of the fire-place and flues; which are generally ill adapted to the burning of wood or turf, without working the houſe unſteadily, and giving the perſon who attends them much trouble.

Such a furnace, as is repreſented by Fig. 1. Plate V. is better calculated for burning wood or turf than any other I know. And although I never had occaſion to uſe that kind of fuel at Wemyſs Caſtle, where coal is plenty; yet, when at the Marquis Townſhend's in Norfolk, I was under the neceſſity of ſubſtituting other kinds of fuel for the uſe of the Pine ſtoves; and to burn which, I pulled down and altered my furnaces, from the common, to the plan as repreſented by the Plate. The fuel I uſed was turf and ſcreened cinders, mixed in equal quantities; and a more ſteady fire I have never uſed any where.

Pine ſtoves are variouſly conſtructed. Some are ſingle pitted; ſome double; and ſome are even triple pitted; ſome have flues running under, and ſome round the bark-bed. I diſapprove of theſe; being very dangerous to the roots of the plants, if over-heated. I alſo diſapprove of double and triple ſtoves; as being very uneaſy to work in ſtormy weather, and confining a great quantity of ſtagnate unwholeſome air in dull hazy weather. A ſtove, where fire heat may be perfectly at command, and in which a free circulation of air can be admitted in all parts, is certainly to be preferred; and none can be ſo convenient for this purpoſe as a ſingle one: and where it is in agitation to erect one, I would recommend ſuch as is repreſented by Fig. 2. Plate 1.

For the ſake of uniformity, if placed in a range of vine and peach houſes, &c. it may be raiſed to the ſame height with them; obſerving to raiſe the bark-bed accordingly, the ſurface of which ſhould not be farther than four or five feet from the glaſs. The ſucceſſion-houſe may alſo (if requiſite) be of the ſame conſtruction; and a nurſing pit (See Fig. 1. Plate I.) will be found to be of great advantage, and anſwer the purpoſe perfectly.

The ſituation is immaterial, provided the ſurface be dry, as the bark-bed is raiſed above it, and paved. And hence it appears that I do not approve of a border being made in front for the production of grapes to be trained up the rafters, which I eſteem as being highly prejudicial to the Pines. For my method of preparing the border, and training vines in the Pinery, See Section XII. on the culture of the grape.

SECTION II.

On the Preparation of the Bark-Bed.

THIS is an article of much conſequence to the welfare of the plants; and if not judiciouſly performed, is productive of great evil. It is no uncommon thing to hear of whole pits of Pines being burnt at the root by the over-heating of the bark-bed; and Mr Speechly and others give this as a principal reaſon for their uſing oak-leaves. I have grown Pines for many years, and can declare that I never had the roots of a ſingle plant injured by bark-heat; and if my method of preparation is ſtrictly followed, I can be bold to augur that none ever will. The manner is the moſt ſimple imaginable.

My opinion, in reſpect of the quantity and quality of bottom heat required by the Pine, has been different from that of any other author I have read on the ſubject.

ject. Pine plants, except in ſtriking of ſuckers, &c. ſhould not ſtand in a bottom heat above that of blood-heat at any time, and that too of a mild moiſt nature. If the watch-ſtick, to the depth of the bottom of the pot, feels juſt a little warm when felt with the hand, or applied to the cheek when the body is of a comfortable temperature, it is ſufficient; and it certainly conſiſts with reaſon, that the bottom and ſuperficial heat ſhould correſpond at all times. For the more effectual attainment of which, and that the roots may ſuſtain no injury, the following rules, for turning and trenching the bed, are what I have followed, viz. never to ſift the tan in the pit at any time; never to add above an eighth of new, which, if neceſſary, give place to by ſkimming off a little of the ſurface of the old; never to ſuffer the new tan to lie within a foot of the ſurface, by which means the pots are entirely plunged in the old; to lay the half of whatever new tan is added, in the bottom of the trench, and divide the other half equally to within a foot of the ſurface of the bed: in trenching, to throw the ſides to the middle, and the middle to the ſides, that there may be an equal mixture of the old tan. Thus will the bed be of a mild and equal temperature from the firſt, and will continue much in the ſame ſtate for three or four months; and, after the firſt filling, is attended with very little expence for new tan.

From the above, it is obvious, that, in filling the pit of a new Pinery, it ſhould either be done ſeveral months before the plants are to be placed therein, or ſhould be well ſweated and reduced by turning, in an open ſhed, &c.; but it would be adviſable not to plunge the pots above half their depth, for the firſt two or three months after filling, in either caſe.

In adding new tan, it ſhould always be thrown up in an heap for eight or ten days before it be uſed, in order to drip and ſweeten; and ſhould never be applied freſh from the tan-yard; being both wet, and apt to heat violently and cake in the bed, if applied in that ſtate.

Some object to tan, on account of the expence and trouble attending the working with it: but, if the above method is practiſed, theſe will be found to be inconſiderable; and, as the plants require frequent ſhifting, the ſtirring up of the bark-bed at that time is a trifling trouble, and ſometimes the addition of new tan is unneceſſary.

I am convinced there is no ingredient can be ſubſtituted for tan, that will equally anſwer the purpoſe in the Pinery; and therefore would recommend the uſe of it, in preference to all others, where it can be procured on reaſonable terms: but leſs or more of it is indiſpenſably neceſſary.

Oak-leaves are certainly the next beſt material; but they are not to be had in many places. Where they are uſed, I would adviſe that at leaſt eighteen inches of well-reduced tan be laid on the ſurface, wherein to plunge the pots.

A mixture of ſtable-dung and tree-leaves of any kind, is the next beſt ingredient. But theſe ſhould be well fermented before they are uſed, and at leaſt two feet of reduced tan ſhould be laid on the ſurface.

Some have underſtood the reaſon why Pines are planted in pots inſtead of the ſurface of the bed, to be the want of permanent heat in it; that they may be removed with the greater facility in the time of renewing the bark, &c. This is not my idea of the matter. For were the heat of the bed rendered ever ſo permanent, I would rather grow my Pines in pots: and here let me obſerve, that I would never wiſh to be concerned in the culture of Pines, unleſs I had at leaſt two diſtinct compartments for the purpoſe. All plants of any kind do not grow alike in their native clime; much leſs the Pine in an artificial one. Hence the neceſſity of at leaſt two compartments, and growing the plants in pots; that they may be removed and claſſed, according to circumſtances, with the greater eaſe and ſafety. Moreover, many plants, in any ſituation, do much better in pots than otherwiſe: of theſe are all the ſucculent tribe; and ſurely the Pine may be reckoned amongſt them.

SECTION III.

On Propagating the Plants.

PINES are propagated moſt ſucceſsfully by crowns, produced on the top of the fruit, by ſuckers produced from between the leaves, and by ſuckers produced from the root of the old plant. Theſe laſt are the moſt deſpiſable, and ſhould never be uſed except in a caſe of neceſſity. The crowns are twiſted from off the fruit when ſerved at table; the ſuckers, by breaking down the leaf immediately under, and moving them gently from ſide to ſide: but this is not to be done till the under part is ripe and of a brown colour, otherwiſe the ſucker is apt to break by the middle.

Much ſtreſs is laid on the article of drying them; ſome recommending a week, others a fortnight, and ſome the laying them on the ſhelves, flues, &c. of the ſtove: but if they are perfectly ripe, and the old plants have had no water for a week or two before they were taken off, (which they ought not), nothing of this kind is neceſſary.

The crowns are gathered one by one, as the fruit is uſed; and ſhould be ſtuck into the bark-bed till the whole crop, both of them and ſuckers, can be potted together Let a few of the bottom-leaves be rubbed off with the thumb, and let the under part of the ſtump be ſmoothed with the knife; and place them in pots of three or four inches in diameter and five or ſix deep*, (according to their ſizes), being filled with entire vegetable mould of decayed tree-leaves; in the bottoms of which ſhould previouſly be laid a little clean gravel, of the ſize of horſe-beans, to the thickneſs of an inch.

Meantime, let the nurſing-pit be prepared for their reception; and, deviating

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* Pots of this proportion are not generally to be had; but where there is a ſtock of Pine plants, there ſhould be a ſet of pots of all ſizes made for them on purpoſe, three or four inches deeper in proportion to their width, than thoſe in general uſe. My reaſon for which is, that a handful of clean gravel may be laid in the bottom of each pot, which I find is of infinite ſervice to the plant: the Pine requires frequent refreſhings with water, but will not bear the ſmalleſt degree of its ſtagnation.

from the rules given in laſt Section, let new tan, to the extent of a fifth or ſixth part, be added; but ſuffer none to lie within ten or twelve inches of the ſurface. Here plunge the pots quite to the brim, in regular order, at the diſtance of two or three inches pot from pot each way, and keep them perfectly level.

It may here be expected, that I ſhould ſay whether crowns or ſuckers ought to be preferred. To be plain, I do not prefer a good ſucker to a good crown; for, if the ſucker has the advantage of being a ſtronger plant, it has alſo the diſadvantage of running to fruit more untimouſly than the crown.

SECTION IV.

On Preparing the Mould; and what Kind is fitteſt for the Pine Plant in its different States.

VEGETABLE mould being a chief ingredient, a ſtock of it ſhould be provided wherever the culture of the Pine is followed. The kind to be uſed here is that from decayed tree-leaves, and thoſe of the oak are to be preferred; but where a ſufficient quantity of them cannot be had, a mixture with thoſe of the aſh, elm, birch, alder, maple, ſycamore, &c. and indeed any kinds, that are not reſinous, will anſwer very well.

In Autumn, and immediately as the leaves fall *, let them be gathered and thrown together into an heap, and let juſt as much light loam, as will ſerve to keep them from being blown abroad by the wind, be thrown over them. In this ſtate let them lie till May; and then turn them over and mix them well; they will be rendered into mould fit for uſe by the next Spring; but from ſticks, &c. being amongſt them, will always require to be ſifted before they are uſed.

Strong brown loam is the next article. This ſhould conſiſt of the ſward of a paſture if poſſible, which ſhould, previous to uſing,

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* They ſhould never be ſuffered to lie above a day or two, otherwiſe they loſe much of their virtue; but ſhould be gathered into an heap as they fall, in order to bring on a fermentation while they retain their ſaline juices.

uſing, be well reduced, by expoſing it a whole year to the action of the weather.

Pigeon-dung alſo, that has lain at leaſt two whole years in an heap, and has been frequently turned, and well expoſed to the weather, is to be uſed. Alſo, ſhell-marl. And laſtly, ſea or river gravel, which ſhould be ſifted and kept in a dry place; ſuch part of it as is about the ſize of marrow-fat peas is to be employed.

This is the proportion:—For crowns and ſuckers, entire vegetable mould, with a little gravel at bottom, to ſtrike in; afterwards, three-fourths vegetable mould, one-fourth loam, mixed with about a twentieth part gravel, and a little entire gravel at bottom, till about a year old. For year olds, and till ſhifted into fruiting pots,—one-half vegetable mould, one-half loam; to which add about a twentieth part gravel, and as much ſhell-marl, with a little gravel at bottom, as above. For fruiting in, one-half loam, a fourth vegetable mould, a fourth pigeon-dung, to which add gravel and marl as above, and lay two inches of entire gravel at bottom.

Of this compoſition has been the mould I have uſed for years, with, perhaps, as general ſucceſs as moſt gardeners. But my ideas are not ſo contracted as to preſume, that this may not be deviated from, in any caſe, or that it cannot be improved. It is given as what I conſider to be a good medium ſoil for the production of the Pine; and with the hope that the candid will apply, improve, or partly reject, according to circumſtances and practical obſervation.

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SECTION V.

On the Treatment of the Plants the Firſt Year *.

IF the plants were ſtruck (as is directed in Section III.) about the firſt of September, the bed will continue of a kindly heat till the firſt or middle of November, and muſt then be worked over, and about an eighth part of new tan trenched in.

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* I reckon the year from the 1ſt of September, ſuppoſing the crop to be all cut, and the crowns and ſuckers to be ſtruck at that time.

The plants will alſo have made good roots by this time, but will not generally require freſh potting; therefore, let ſuch *only* as are anywiſe matted, be put into pots of the next ſize immediately above thoſe they are in, obſerving to take off the matted part only, and put them in, balls entire.

Plunge them to the brim as before, and let them remain till the 1ſt of March.

At this time, let the bed be worked over as directed in Section II.; let the plants have the mould entirely ſhaken from their roots, be put into the ſame pots, and plunged as before. Here the roots which are freſh are not to be diſturbed; only cut away thoſe that are waſted, and any rotten part about the bottom of the ſtump.

They will now grow vigorouſly, and will again require potting about the firſt or middle of May; at which time alſo, let the bed be ſtirred up to about half its depth, and if neceſſary, let a little new tan be worked in. Put the plants into pots of about ſix inches in diameter * on a medium, according to their ſizes, with the balls entire; and if any of them are matted, diſplace that part; plunge them to the brim, at the diſtance of about fifteen inches * from centre to centre of the plants, and give a little water.

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* This is always to be underſtood as the inſide diameter at top, and the particular number of inches ſpecified, to be a medium for the plants according to their ſizes.

About the firſt of Auguſt they will require freſh potting, and if there are three compartments, being removed into the ſucceſſion-houſe. Let the bark bed be worked to the bottom at this time, the plants put into pots of eight inches in diameter, plunged to the brim at the diſtance of ſixteen inches on a medium, and ſettled with a little water.

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SECTION VI.

On the Treatment of the Plants the Second Year.

ABOUT the middle of November, the bark-bed will require to be worked over to laſt for the Winter; the plants muſt not be ſhifted at this time, but let any decayed leaves about their bottoms be twiſted
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ed off, let a little freſh mould be laid on the ſurface of the pots if requiſite, and replunge them to the brim as before.

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* This muſt be underſtood of the largeſt plants; a foot will be ſufficient for the ſmall ones.

I would here obſerve, that I diſapprove of the cuſtom of tying up the leaves of Pine plants at the time of ſhifting or potting; the intention is to keep them from being bruiſed, but they are generally much more bruiſed in the tying, than when left looſe. My method has been, to have a perſon ſtanding oppoſite me in the time of potting, (performed on a ſtage or table about a yard high), whoſe buſineſs was to hold up the leaves in a looſe though regular manner between the arms, and prepare and hand the pots, while another hands and ſets aſide the plants. In this manner I have often ſhifted an hundred one-year old plants in two hours.

In carrying the plants through the doors of the ſtove, the perſon ſhould turn back foremoſt, by which it is eaſy to ſave the leaves from injury, as in that caſe the pot goes firſt, and the leaves are drawn backwards.

By the firſt of March, the plants will again require ſhifting, and the bark-bed trenching as before. Let the plants at this time be ſhaked out, and replaced in the ſame pots, in entire new mould, cutting off any decayed roots, or the end of the ſtumps, and twiſting off a few of the bottom leaves, &c. Replunge them as before, and give a little water.

About the firſt of June they muſt again be ſhifted. Work over the bark-bed to about half its depth, and add a little freſh tan if neceſſary; place the plants, balls entire, into pots of about ten inches in diameter, plunge them at the diſtance of eighteen inches from centre to centre, and ſettle with a little water.

In potting at all times, a few of the bottom-leaves ſhould be twiſted off, that the plant may make freſh roots to furniſh the ſurface, which alſo tends to keep it ſteady in the pot.

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SECTION VII.

On the Treatment of the Plants the Third Year.

BY the middle of Auguſt or the firſt of September, the plants muſt be put into their fruiting pots, and ſhould be placed in the fruiting ſtove; and for their reception, the bark-bed therein muſt be prepared, by trenching it to the bottom, and adding about a tenth part of new tan. Put the plants into pots of a foot in diameter, plunge them to the brim, and give a little water. In potting, a ſmall ſtick ſhould be uſed to tindle down the mould between the ball and ſide of the pot, ſo as to leave no cavity, and this ſhould be obſerved at all times.

About the middle of November, the bark-bed will require to be ſtirred to half its depth, and a little freſh tan added; but the plants are not to be ſhifted at this time; therefore, replunge them to the brim again for the Winter.

It is common at this time, to add a great deal of new tan, in order to keep up a ſtrong bottom heat through the Winter; than which, nothing can be more erroneous in my idea of the matter. I have already ſaid, that the bottom and ſuperficial heat ought to correſpond at all times; and if the houſe is to be worked to 60° *only*, for the Winter, it certainly follows that a very moderate degree of bottom heat is ſufficient. The temperature of the houſe being ſo much reduced in Winter, is to prevent the plants from ſtarting too ſoon into fruit; and their doing ſo, is frequently more in conſequence of too much bottom heat, than irregularity in the climate.

By the firſt of February, (the beſt ſhowing-ſeaſon,) the bark-bed will require trenching; and this is the only time of the year that I would adviſe a deviation from the rules given in Section II. From this time, the houſe is to be worked as high as 70°; and that the bottom heat may keep regular pace with the ſuperficial, new tan to the extent of a ſixth part may be added.

Such of the plants as are not ſhown at this time, are healthy at the root, and ſtand erect and firm in the pot, ſhould have a little freſh mould laid on the ſurface, by the removal of about two inches of the old. But let thoſe that are *already ſhown*, and thoſe which are anywiſe unhealthy, or appear ſtinted, be *ſhaked out entirely*, and replaced with freſh mould in the ſame pots; but none of the roots, unleſs waſted, muſt be cut away.

The above, in reſpect of the plants that are *ſhown*, I preſume, has never been recommended before; and I am happy in being enabled to do ſo with confidence. It has ever been a matter to be regretted, that Pines, from the want of ſun and air in the Winter months, are apt to be ſtinted, and ſhow their fruit too ſoon; and that fruit ſo ſhown, ſeldom come to be of any conſiderable ſize or flavour; the plants thus ſtinted, being unable to nouriſh the fruit; and theſe, from the want of ſunſhine in the early months, coming far ſhort in flavour to thoſe matured at a later period.

I firſt tried the experiment on a dozen of plants; the half of which were in, and the other half paſt the flower, at this time of the year. They were kept back a full month by the operation. Thoſe that were paſt the flower equalled, and thoſe that were only in flower conſiderably exceeded any of the others of their forwardneſs at the time of ſhifting. Being encouraged by my ſucceſs, I treated my whole ſtock of *fruiters*, in the manner as directed above, the following year; they were kept back to a better ſeaſon, and ſwelled their fruit to as good a ſize as thoſe that ſhowed in February.

About the firſt or middle of May, let the bark-bed again be trenched to the bottom, a tenth of new tan added, and the plants replunged as before; and no further trouble is neceſſary on this head.

SECTION VIII.

On the Temperature of the Pinery.

FOR the nurſing-pits, the fires will require to be lighted about the firſt of October. Work ſo as to keep the thermometer at nine at night, and ſeven or eight in the morning, as near to * 65° as poſſible, till the firſt of March, and then gradually increaſe to 70°, at which continue, till fire heat is unneceſſary.

For the ſucceſſion-houſe, light the fires as above, according to the ſeaſon; keep

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* Fahrenheit's ſcale.

at 60° till the firſt of March, and then gradually increaſe to 65° for the ſeaſon.

And for the fruiting-houſe, work to 60° till the firſt of February, and then inſtantly riſe to 70°; increaſe gradually to 75° till the firſt of March, at which work for the ſeaſon.

Although it is not practicable to work to a degree as here ſtated, yet the beſt endeavours ſhould always be uſed to do ſo; and no perſon ſhould have the management of the fires, who has not alſo the charge of the houſe.

SECTION IX.

On the Admiſſion of Air to the Pinery.

IN Winter, even froſty air ſhould be admitted, but in a moderate degree, and always at the top of the houſe; but in freſh weather, at this ſeaſon, air ſhould be admitted to the extent that the thermometer may not riſe to more than 5 degrees above the fire-heat medium, and that till the middle of March; after which, and for the whole ſeaſon, not to more than 10 degrees.

In Winter, I have frequently made fires in the morning, ſolely for the purpoſe of enabling me to admit air, and at the ſame time keep up the temperature of the houſe.

Although the Pine (from its nature) does not appear to *quickly feel* the effects of bad management, there are few plants in reality do it more ſo; and too due an attention to the temperature of the houſe, eſpecially in Winter, cannot be paid, the want of which is almoſt ſure to throw the plants into fruit at an untimely ſeaſon.

Very large portions of air ſhould be admitted to the fruiting-houſe, while the fruit are ripening; this is not only eſſential to the flavouring of the fruit, but highly conducive to ripening and hardening the ſuckers.

Some ſhade their pines at certain times; but I cannot conceive this to be neceſſary, except perhaps in ſtriking crowns and ſuckers, which, by the erroneous practice of *drying* them, have been enfeebled.

SECTION X.

On Watering and Steaming the Pinery.

WATER muſt be given ſparingly to the plants in dull weather, particularly in Winter. From about the firſt of October to the firſt or middle of March, once in eight or ten days will generally be ſufficient, and that in very moderate quantities; but from March to October, plentiful waterings will be requiſite, and conſiderable quantities at a time, generally once in three or four days.

The crowns and ſuckers muſt have no water for the firſt fortnight after planting; and none over-head the firſt Winter, leſt their hearts ſhould damp. Indeed I do not adviſe watering much over-head, except in clear weather, in Winter. But, in the Summer months, my practice has been, firſt, to give the quantity requiſite to the root, from the ſpout of the watering-pot; and then a ſufficient quantity to wet every part of the leaves from the roſe.

My reaſon for which is, that I have found the different kinds of Pines require very different quantities of water. The Queen requires a third more than the King, Antigua, or Brown Sugar Loaf; and the Montſerat and Green or Stript Sugar Loaf, require a medium quantity between the two. I ſpeak of plants in an equal ſtate of health and ſize.

The fruiting-plants will require very large quantities of water, from the time they are out of flower, till they begin to colour; which ſhould then be gradually withheld, and, towards its maturity, totally. This will enhance the flavour of the fruit, and perfect the ripening of the ſuckers.

Water frequently with the drainings of a dunghill in the Summer months; but not in Winter: as at this time the plants are in a dormant ſtate, they imbibe little nouriſhment; and this kind of water cauſes a ſtench, and produces foul air in the houſe, which cannot be ſo conveniently drawn off at this time as in Summer.

I neither think ſteaming neceſſary nor hurtful to the health of the Pine, except in hazy, dull weather in Winter, at which time it is certainly prejudicial. Therefore, if there are grapes in the ſtove, regulate this matter for their ſakes alone, without reſerve.

Soft, and *well-aired* water ſhould be uſed at all times; and ſhould be applied either about eight in the morning, or four or five in the afternoon.

SECTION XI.

On the Maturation and Cutting of the Fruit.

SOME kinds put forth ſuckers at the baſe of the fruit; which ſhould be rubbed off as they appear. Others put forth ſuckers from the root; and, as theſe are not proper to be taken into the ſtock, they ſhould alſo be twiſted off, or otherwiſe deſtroyed, as they appear.

It is certain, that if a plant were to be diveſted of all its ſuckers, the fruit would grow to a much larger ſize in conſequence; but as this would ultimately tend to the extirpation of the whole ſtock, it is by no means adviſable. However, it is proper to reduce the number of ſuckers on the plant to two or three at moſt. This ſhould be done in the May ſhifting; or when the ſuckers are about half grown. Chooſe the beſt, and deſtroy the others by breaking out their hearts. But where the increaſe of the ſtock is the object, all ſuckers, even of the root, ſhould be encouraged.

Some of the kinds grow on long footſtalks, which are apt to bend down as the fruit gets heavy. Theſe ſhould be ſupported to ſmall ſtakes, &c.: For if the fruit fall over, the ſtalk will be bruiſed, and its nouriſhment will thereby be obſtructed.

Pines loſe much of their flavour if they are ſuffered to grow till dead ripe: and where the gardener is not reſtricted, he ſhould always cut them by the time the fruit has attained to a greeniſh-yellow colour; and either let them remain in the heart of the old plant, or lay them on the wall-plate, &c. in the ſtove, for a few days afterwards.

If required, Pines may be preſerved in good order for ſeveral weeks after they are cut, in the following manner:—Cut them, as above, with the ſtalk as long as poſſible;

put it into a bottle of pure water; which renew every two or three days, and at the ſame time pare a thin ſlice off the end of the ſtalk; and place it in a temperate and well-aired room of about 60 degrees.

It may be expected here, that I ſhould ſay ſomething in reſpect of the flavour of the different kinds. This I chooſe to avoid, as men's palates are as different as their minds; but I would obſerve, that the Queen is moſt to be depended on for a ſure and regular crop. The Antiguas and Brown Sugar Loaf grow the largeſt of any, and make a noble appearance on the table; but they frequently fruit untimouſly. I have had a few plants of the Montſerat which did not fruit till the fifth year; and I was then under the neceſſity of placing them in the green-houſe for a fortnight, in order to give them a check. The King is, of all others, my favourite; and I have been at much pains to diſcover the bent of its nature. I find it requires much leſs water, and a greater quantity of gravel, both in the mould and at the bottom of the pot, than any of the others.

SECTION XII.

On the Inſects that infeſt the Pine; and how to deſtroy them.

THESE are, the brown and white ſcaly inſect, of the coccus tribe; to which may be added the ant. But, as I could never diſcover that theſe laſt do any harm to the plant, and as they are ſeldom ſeen if the former be not preſent; I am rather inclined to think, that their preſence is in conſequence of that of the coccus, on which they ſeem to feed. The brown ſcale does no other injury to the plant than dirtying it, and therefore is of little importance. But the white ſcale, or bug, is of the moſt miſchievous nature to the plants; and where it abounds, little good may be expected of them.

For my own part, I have been ſo far happy in this reſpect, that I have never had it in my power to try experiments for their deſtruction, but once; and as I was completely ſucceſsful, I ſhall candidly lay my method before the reader.

When I went to Wemyſs Caſtle, the whole ſtock of Pines * were infected to that degree, that I had obtained permiſſion, and was determined, to throw them out; but having built a nurſing-pit, and not having immediate occaſion for it, I bethought myſelf, and treated them in the following manner. I prepared a ſtrong heat for them in the bark-bed of the nurſing-pit; ſhaked out, and cut every fibre from their roots, (whereby they were rendered the ſame as ſuckers at firſt), not excepting thoſe that were in fruit, ſome of which were juſt in flower; dipped them into liquor †, the ſame as is recommended in Chapter III. Section VII., excepting the turpentine; put them into pots, ſix inches in diameter, and plunged them to the brim; kept up a fire heat to about 75 degrees; gave them but little air; ſhaded them in ſunſhine; and gave them plentiful

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* Theſe were in a ſmall ſtove in the old garden; the new garden and hot-houſes not being then built.

† This experiment gave riſe to my trying it for other inſects; but I found it ineffectual for the deſtruction of the caterpillar and grub, without the addition of turpentine.

tiful waterings over head with the ſame mixture reduced to about half its former ſtrength.

I continued this treatment for two whole months. At the end of which, I again ſhaked out their roots, and waſhed the whole plant in pure water; put them into freſh pots, eight inches in diameter; replunged them into a kindly heat in the other nurſing-pit; and treated them in all reſpects as other plants. I never ſaw a veſtige of the bug afterwards; and of thoſe very plants were produced my principal ſtock. A few indeed of thoſe that had ſhown fruit died; but the others brought ſuch fruit as might have been expected from plants of their ſize, of any other kind.

CHAPTER X.

STRAWBERRIES.

THIS fruit is forced in moſt gardens where there are hot-houſes of any kind; and, being generally underſtood, with equal ſucceſs. I ſhall therefore be very brief in treating of it here; the only reaſon of my doing ſo at all, being to render this work as complete and uſeful as poſſible.

Strawberries are brought to early perfection in the pine-ſtove, vinery, peach-houſe, &c. But, in my opinion, the cherry-houſe is the fitteſt for its production, as the climate there coincides more nearly with its nature. As a compartment wholely for its uſe, flued pits are beſt adapted; and might be advantageouſly employed, in the latter part of the ſeaſon, in the production of melons, &c.

In any ſituation, the plants ſhould have plenty of free air, eſpecially when ſetting and ripening; and be abundantly ſupplied with water till the fruit begin to colour; after which, very moderately.

My method of preparing the plants for forcing is this:—In the middle of July, or firſt of Auguſt, (when the runners of Strawberries out of doors are producing fine young plants), fill pots, of ten or twelve inches in diameter, with ſtrong, rich loam; and plant three or four in each: ſettle them with a little water; and place them behind a wall, &c. to ſhade them, till the plants have taken root; after which, plunge them to the brim in any dry open ſituation in the garden.

Dreſs off their leaves in Autumn; cover them with a little litter in Winter, to prevent the pots from being waſted by the froſt; pinch off any flowers that may appear in the Spring; keep them clear of weeds, &c. in Summer, and in dry weather refreſh them with a little water; and in

Autumn dreſs off the leaves, &c. as before. They will be fit for forcing any time after Chriſtmas.——Of all the kinds, the ſcarlet is to be preferred.

As the plants are of no uſe after being forced, a quantity ſhould be prepared as above, every ſeaſon, where they are in requeſt.

CHAP-

CHAPTER XI.

THE GREEN-HOUSE.

SECTION I.

On the Conſtruction of the Green-Houſe.

THIS compartment being an object of taſte alone, is more ſubject to diverſity in its conſtruction, and that too with more propriety, than any other in the garden. And although the gardener (if a judge) ſhould have the ſole direction in building the different ſpecies of forcing-houſes; yet the fancy of the proprietor, I ſpeak in general terms, in reſpect of the Green-houſe or Conſervatory, may be more ſafely indulged in: ſince nothing is at ſtake here in compariſon to what is in the pinery, grape-houſe, or peach-houſe.

Many Green-houſes are not paved. This, in my opinion, is erroneous; as the water that drops from the plants, in watering, cauſes much damp in Winter, which is very prejudicial to the health of the plants. Water ſo ſpilt ſhould be inſtantly wiped up; and this cannot be done where the floor is of earth or ſand. The floor ſhould therefore be bedded on brick-bats, ſtone-chips, furnace aſhes, &c.

Air and light, in Winter, being of the utmoſt conſequence to the health of the plants, the free admiſſion of them ſhould be ſtudied in the conſtruction; and, at the ſame time, that wherein a great deal of fire heat may not be required, which tends to draw the plants up weak in Winter and Spring.

Plate VI. repreſents the plan of an approved Green-houſe, for breeding and bringing young plants to an early flowering ſtate. But where elegance in the building is ſtudied, and the front is to be of free ſtone; architecture and maſonry may have their full ſway *, in any of the orders but that

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* The Green-houſe at Wemyſs Caſtle is ſuppoſed to be the moſt elegant of any in this country. The front is of freeſtone: and done to the Corinthian order, in the lighteſt manner. The windows are circular; whoſe width is ſix feet and an half each, and the pilaſters only eighteen inches.——It is placed in the centre of the principal range of hot-houſes, and has a very fine effect.

that of the Gothic, without much inconvenience to the plants: but this laſt, from the conſtruction of its arches, is of too dark a nature for their welfare *.

SECTION II.

On the Temperature of the Green-Houſe.

LITTLE fire-heat is neceſſary here; except in the time of a ſevere ſtorm, or in long-continued dull weather, to dry off damp. In the former caſe, the thermometer, in the night, ſhould not ſtand above 50 degrees at any time; nor ſhould it be under 40 degrees, as otherwiſe many tender plants might ſuffer. In the latter caſe, it may ſometimes be adviſable to light pretty ſtrong fires, in order that large portions of air may be admitted: at which times, if the thermometer ſtand above 35 degrees, it is ſufficient.

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* In ſome late deſigns, where an elegant Green-houſe has been wiſhed as a centre-piece, I have ſhewn a glaſs, inſtead of a ſlate or lead roof; a matter of evident utility, as thereby the plants enjoy both a perpendicular and horizontal light.

SECTION III.

On the Admiſſion of Air to the Green-Houſe.

AIR and light are of the greateſt conſequence to the welfare of the plants; and ought to be encouraged at all times. In ſome Green-houſes, it is common to cover at night with canvas, mats, &c. in order to ſave fuel in winter. Theſe ſhould always be removed betimes in the morning, to admit the rays of light as they break from the horizon; and ſhould never be put on at night till the twilight, to exclude them. A free and large circulation of air muſt be admitted, according to the weather; even froſty air in Winter muſt not be entirely excluded, eſpecially in ſunſhine.

In the Spring, keep the houſe cool and well-aired; otherwiſe the plants will grow both too tender and too rapidly, to bear the weather when ſet out of doors, without being much hurt at firſt: and for ſeveral weeks previous to the plants being put out, the houſe ſhould ſtand open, to its fulleſt extent, both night and day. Let it alſo remain open for ſeveral weeks after taking the plants in, in Autumn, leſt they begin to grow, which is not adviſable at this time.

SECTION IV.

On Watering the Green-Houſe.

ACCORDING to the variety and nature of the plants herein contained, ſo is that of the quantity and frequency of watering: and hence the impropriety, nay impoſſibility, of any rule being given.

The judgment and diſcretion of the gardener muſt here be entirely relied on; but a few hints may be uſeful. Plants are like infants: they will complain when hungry or thirſty; and, like them, too, ſhould be timouſly prevented by the indulgence and care of the nurſe. Is it not painful to think, that an infant ſhould cry and endure pain for what it cannot expreſs? Even ſo with a plant. I have often felt much pain in ſeeing a plant *flagged* for want of that very element without which it could not long exiſt; and the more ſo, if want of attention was the cauſe.

On the other hand, an infant may be much hurt (nay, killed) by being too much glutted with food or drink, eſpecially if of a bad quality. So it is with a plant. Therefore, the niceſt obſervation is neceſſary, to diſcover their natural inclinations; and which ſhould be treated and encouraged in a kindly manner at all times.

In Winter, and when the plants are in a dormant ſtate, it is ſafeſt rather to give too little than too much water; and the contrary in ſummer, and when the plants are in a vigorous growing ſtate.

A practice too commonly prevails, of placing a flat or ſaucer under the pots, eſpecially of plants kept in the drawing-room or parlour; which may be very proper, for the ſake of the furniture; but which is too generally of miſchievous conſequence to theſe ſhrubs. If the ſaucers were emptied ſo ſoon as the ſuperabundant water has filtered through the earth of the pot into them, it were well; but if left there to ſtagnate, it muſt of neceſſity operate

rate to the deſtruction of the roots, and ruin of the plants.

In the ſpring, when in the houſe, and in dry weather in Summer, when out of doors, they ſhould be occaſionally waſhed with the hand-engine, in order to refreſh and keep the foliage clear of duſt, &c. and in Winter, any water that may be ſpilt in watering ſhould be carefully wiped up, to prevent noxious damp.

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SECTION V.

On the Compoſt Mould to be uſed in the Green-Houſe.

WHAT I have ſaid in the laſt Section, in reſpect of the nature and inclination of the plants, might with equal propriety be ſaid here. I will therefore only drop a few hints on this ſubject.

Many kinds of mould are neceſſary, to form the many different compoſts that are required; and where there are a great variety of plants, and their culture is induſtriouſly ſtudied, the following ought not to be wanting:—
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Clay, gravel, ſand, ſtrong loam, light loam, peat-earth, moſs, marl, vegetable mould, lime, and rotten dung. Out of which, according to the nature of the plant, may be formed a compoſt of any kind for its uſe. But of this, a novice cannot be ſuppoſed a competent judge: Some practice, and much obſervation, are neceſſary requiſites.

SECTION VI.

General Obſervations.

IT is neceſſary to put out the greater part of Green-houſe plants in the Summer months, in order to harden and keep them in ſhape; but they ſhould not be ſet out before the froſts are quite over, which is ſeldom before the firſt or middle of June. For two or three weeks, they ſhould be placed behind a wall, or other fence, to ſhade them from the violence of the ſun, and keep them from being ſcorched, or otherwiſe injured by the weather. After which, they may be placed in any form or ſituation which fancy requires; provided the expoſure is ſuch, that they may enjoy at leaſt one-half of whatever ſunſhine there is. Here let them remain till the end of September or 1ſt of October, according to the weather.

Some of the tender kinds will require to be let ſtand longer in the houſe in the Spring, and taken ſooner into it in Autumn, than the others.

The beſt time for general ſhifting or potting, is, when they are removed out of or into the houſe; but individuals may be freſh potted at any time.—The luxurious growing kinds ſhould be rather under-potted, and kept in ſtiffiſh ſoil; which will tend to check their growth.

Theſe plants look much better, when of an ordinary ſize, than when ſuffered to grow tall, and with naked ſtems. Therefore, they ſhould be frequently headed down and trimmed; ſo as to make them put forth young ſhoots in every part, if poſſible. They ſhould alſo be diveſted of all dead branches and leaves as they appear, at all times.—Young plants of all the kinds that will, ſhould be *ſtruck* every ſeaſon; and the others ſhould be propagated by layers, budding, or grafting, in order to keep up a ſtock.

On the ſtage, they ſhould be placed, in manner of an amphitheatre; regular, thin, and the kinds ſhould be as much intermixed as poſſible, which gives the better effect to the whole. They ſhould be frequently turned round to the ſun, in order to make them grow upright and equal on all ſides.

The ſlower theſe plants grow, the better; provided they do grow, and are healthy.

The aphis and thrips are often very troubleſome in the Green-houſe; which ſhould therefore be frequently fumigated with tobacco, in order to deſtroy them.

CHAPTER XII.

EXPLANATORY OF THE PLATES.

SECTION I.

Explanation of Plate I.

FIGURE I. repreſents the plan and ſection of two nurſing-pits, on a conſtruction that will equally anſwer the ſtriking of young Pine-plants and forcing Aſparagus, Cucumbers and Melons, Strawberries, French-Beans, Sallads, Flowers, &c.

For the conveniency of ſhifting the tan, &c. the pit is ſunk to the depth of a yard below the ground level, but where the ſituation is not perfectly dry, this is not adviſable; therefore, if the ſituation is damp, the pit ſhould be built on the ſurface, and a ſloping bank ſhould be raiſed all round, to the height of a yard, againſt the ſides and ends; and this I chiefly adviſe, on account of the value of the front flue, which may be ſo eaſily rendered ſerviceable in raiſing early ſallads, &c. on a well-prepared border immediately adjoining thereto, as hinted in the note, page 19.

Here the furnaces are placed behind, communicating firſt with the front flues, which return in the back, ſingly. The ſurface of the bark-bed is level with the bottom of the flues all round, a cavity ſeparates the front flue from the bark-bed, and conſequently no apprehenſion of burning need be entertained. The inner wall of the flue is a brick on edge, and for the ſake of ſtrength, the outer wall a brick on bed.

Although in this deſign the diviſions are but thirty feet long each, yet were a greater extent required, they might be made forty, as a furnace is perfectly capable of working that much, if the pit is of the ſame width.

One length of a ſaſh is ſufficient here, and they are worked in the manner of a common hot-bed, with faſtenings at top to keep them from ſlipping down.

Fig. 2. repreſents the plan and ſection of a ſingle-pitted Pine-ſtove, on an improved and much approved conſtruction, either as a fruiting or ſucceſſion houſe, worked by two fires, and having a ſhed behind, which will be found a great conveniency in many reſpects; ſuch as the keeping of moulds, tan, &c.; and it is alſo well adapted to the cultivation of muſhrooms.

The bottom of the bark-bed is level with the circumjacent ground; and its ſurface is gently elevated, to the intent that the plants, when properly arranged, may enjoy an equal ſhare of ſun and light. Some pay little reſpect to this article, keeping the ſurface of the bed perfectly level, and placing the plants indiſcriminately therein; but my method has been to arrange the plants in manner of an amphitheatre, that they might enjoy the rays of the ſun more equally.

Trelliſes are placed againſt the back-wall, and upright ſaſhes in front, whereon to train the vines in this compartment; which is preferable to the method of training them up the rafters, as is generally practiſed. (See Section XII. on the Grape.)

Here muſt be two lengths of ſaſhes on the roof; the under ones ſhould *all* be made to move either up or down, and the upper ones to move down alternately, to the extent of half their lengths at leaſt. It is immaterial whether the upright ſaſhes are made to ſlip or not, as by moving the under ones of the roof upwards, *bottom air* can be admitted equally well.

Here alſo would ſallads, &c. ſown on a well-prepared border, cloſe by the front wall, reap great advantage from the heat of the front flue, which in this compartment requires to be kept very hot all the Winter and Spring months, having the greateſt command on the temperature of the houſe.

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SECTION II.

Explanation of Plate II.

FIGURE I. repreſents the plan and ſection, and alſo the elevation of the front wall of a Cherry or Fig houſe, worked by one fire, that communicates firſt with the front flue, and has two returns in the back wall; which returns are made on the ſuppoſition of its being converted into a Peach-houſe at pleaſure; but while it is appropriated to the cultivation of cherries or figs, the back flues ſhould be ſhut by a damper. See Chap. III. Sect. I.

The trees are trained to a trellis placed againſt the back wall, and if the border is not occupied by French beans, ſallads, flowers, &c. a row of dwarf ſtandards may be planted in front, within two feet of the flue. Two rows of ſtrawberries may alſo be placed on ſhelves hung againſt the upright ſaſhes in front.

The front flue is run here in the ſame manner as in the nurſing-pits, and conſequently the ſame advantage ought to be taken of it, in reſpect of making a border for raiſing early ſallads, &c. in front of the houſe.

It ſtands on pillars and arches, which laſt ought to be made as obtuſe as poſſible; but where lintels can be procured, they are preferable, and ſhould not be more than ſix inches thick. The pillars ſhould be no thicker than the length of a brick at moſt, that all the ſpace poſſible may be allowed the roots of the plants.

The ſaſhes ſhould be of two lengths on the roof here, all of which ought to be made to move, but the upright ones may be made *dead*.

Fig. 2. repreſents the plan, ſection, and elevation of the front wall of an approved peach-houſe, which is alſo worked by one fire, communicating firſt with the front flue, and returning in the back. The front wall and front flue ſtand on pillars, which ought either to be lintelled, or obtuſely arched. The trees ſhould be planted near to the front wall, and trained to a trellis that covers the whole roof. This is a cardinal improvement in the culture of early peaches and nectarines, as their ſize, colour, and flavour, are thus greatly enhanced: and if an impartial compariſon is made, it will be found, that by training peaches in this manner, a much greater quantity of fruit may be obtained for the ſum expended in erecting the houſe, than by training them on the back-wall. There are evidently many more ſuperficial feet in the roof, than in the ſurface of the back wall, of any hot-houſe.

The ſaſhes are all to be made moveable, both up and down, for the admiſſion of air at top, bottom, and middle.

In the plan of theſe houſes, I have ſhewn no back-ſhed; but, if one is not erected, which in ſome ſituations may be very improper, the *ſtock-hole* ſhould be incloſed with a wall, arched over, and a trap-door made to go down in manner of a ſhip's hold, over which, when not at work, may be laid a little mould, &c. for concealment.

But where the appearance of the furnace is immaterial, it is of no conſequence whether it be covered over or not; as, if the furnaces are built according to Fig. 1. Plate V. they will be found to *draw well* in any ſituation.

Fig. 3. repreſents part of an eſpalier rail on an improved conſtruction. Here the poſts are ſet in blocks of ſtone, which are placed under the ſurface of the border; and, for durability, the ends of the poſts are burned, and run in with pitch.

* * *

SECTION III.

Explanation of Plate III.

FIG. I. repreſents the plan and ſection of an approved Grape-houſe, worked by two fires. Here the front wall, and front flue, ſtand on pillars which ſhould either be lintelled or obtuſely arched, as above hinted. The vines are to be planted within a few inches of the front wall, and trained to a trellis which covers the whole roof.

Some build their front walls and flues on the ſurface, without ſupporting them: this is by no means adviſable; as, in this caſe, there is no poſſibility of effectually renewing or trenching the border without endangering the wall and flue, which operation frequently becomes neceſſary.

In this houſe, there are no upright ſaſhes; the length of the roof being of the greateſt importance here. In houſes where grapes are trained on the roof, and which have upright ſaſhes, we generally find that part but indifferently covered with wood or fruit; beſides, it alters the pitch of the roof, which in a houſe for a principal Summer crop is certainly of importance.

Here muſt be two lengths of ſaſhes; all of which ought to be made to move at pleaſure, in order to admit an equal and free circulation of air.

A houſe on this conſtruction is alſo perfectly adapted to the cultivation of peaches; than which, I know not a fitter receptacle for the production of a principal crop; and, if requiſite, it might be extended ten feet more in length, as the fires would command a ſufficient heat for peaches.

In this caſe trees are to be trained againſt the back trellis to the top, and on the front one to half its height only, that the trees on the back trellis may not be ſhaded by thoſe on the front.

Fig. 2. alſo repreſents the plan and ſection of a grape-houſe, which is divided, in order to afford a ſucceſſion of fruit. The front wall and flue ſtand on pillars, that the roots may have a free range; the plants being planted near to the front wall, and trained to a trellis fixed to the roof-beams.

The ſaſhes are alſo to be double on the roof, and made *all* moveable, that air may be freely admitted in all parts of the houſe.

Fig. 3. repreſents the elevation of the front wall of either houſe, being the ſame, except in length.

SECTION IV.

Explanation of Plate IV.

FIG. 1. repreſents the plan and vertical ſection of two diviſions of a hot-wall, on a new and much-improved conſtruction.

Here the flue makes four returns, decreaſing gradually towards the top of the wall, which is neceſſary to the diſtribution of an equality of heat to the ſurface; and here alſo the upper courſe of the flue is carried much nearer to the top of the wall than is generally done, which is of great utility in ripening the extreme ſhoots of the tree, theſe naturally growing later and more ſpungy than thoſe of the other parts.

Some who give deſigns for hot-walls, adviſe building the breaſt of the firſt flue a brick on bed, and that of the other a brick on edge, without decreaſing the depth of the flues as they aſcend, in order to give an equality of heat to the ſurface. But this matter is better accompliſhed by the gradual diminution of the flues, as here ſhewn, though the breaſt of all the flues are a brick on bed. A wall of this kind is more ſubject to the viciſſitudes of the weather than a flue in a hot-houſe; and, conſequently, the breaſt of the flue being a brick on bed, will keep a more conſtant heat, when once warmed, than when on edge. To prevent accidents, however, a trellis ſhould be fixed, or ſpars an inch thick, nailed againſt the *firſt courſe* of the flue, whereon to dreſs the trees; above which they may be dreſſed to the wall without the leaſt apprehenſion of danger. (See Chap. VIII. Sect. XI.)

Fig. 2. repreſents the plan and ſection of a muſhroom-houſe, worked by one fire, and divided for the purpoſe of producing them in ſucceſſion, on a conſtruction that has given ſatisfaction for many years.

Little fire heat being required here, the flues of both diviſions are gathered to the furnace, which works them both equally; and by the help of dampers, the one can be worked higher or lower than the other, with the greateſt facility; or by ſtopping the vent cloſe, the one can be worked altogether independent of the other.

It is a matter of little importance in what ſituation this houſe is placed, provided the bottom of the muſhroom-beds be rendered perfectly dry, by draining, if neceſſary.

* * *

SECTION V.

Explanation of Plate V.

FIG. 1. repreſents the plan, and horizontal and vertical ſections of a Furnace, on the beſt conſtruction yet diſcovered for the uſe of hot-houſes; and to which, from a conviction of its utility, I would ſeriouſly adviſe a ſtrict conformity. It is laid down by a large ſcale, which, I hope, will be found legible to, and underſtood by every operative perſon, without the minutiæ of explanation. But it remains for me to give ſome directions for the working of it, and to deſcribe that which conſtitutes its principal difference from the common furnace.

In the common hot-houſe furnace, the grate occupies the whole ſpace allowed for the fuel, and is alſo generally placed on a level with the bottom of the flue, its entrance being thereby eaſily choaked, which occaſions what is termed an *ill-drawing furnace.* And where the bottom of the flue is elevated above the grate, the conſequence is worſe; in which caſe, the fire burns with ſuch rapidity, that it is hardly poſſible to regulate the climate of the houſe to the degree required; beſides, there is a great waſte of fuel.

This is obviouſly occaſioned by there being no ſpace allowed for the fuel but the ſurface of the grate, through which, and conſequently through the whole fire, the current of air muſt paſs into the flue; whereby it is ſuddenly exhauſted, and the flue heated to a much greater degree than required.

In theſe furnaces, the fire will not laſt above three or four hours; which, in ſtormy weather, and in Winter, occaſions a conſtant attendance, perplexity, and the impoſſibility of regulating a climate in the hot-houſe. But all theſe objections are obviated by the furnace as here repreſented. Here the grate does not occupy one-third of the ſpace allotted for the fuel; and, at the ſame time, is ſufficiently large to kindle the whole maſs; which, when kindled, will keep of a moderate and equal temperature for many hours together. Here, alſo, the operator is not troubled with freſh lighting the fires every day;—I have frequently known them to keep fire for ten days together without any addition of fuel. My method of regulating and working this furnace is as follows:

As after the firſt lighting for the ſeaſon, there is always fire remaining in the back part of the furnace, in *kindling-up* in the evening, &c. clear all the aſhes from off the grate, and the ſpaces at the ſides of it, and bring forward two or three ſhovel-fulls of fire to the front; behind which, throw the quantity of freſh fuel required, ſhut the door cloſe, and in the ſpace of an hour or ſo, reviſit it to ſee how the fire is burning. If it is burning too ſlow, ſtir it up by applying the fire-poker (the end of which is turned up) underneath the grate, clearing the interſtices of the bars the whole length; but if it is burning too rapidly, open the furnace-door a little way; by which means the current of air will be divided, part of it paſſing over, and part of it through the fuel. In the ſpace of another hour, again pay it a viſit; (having previouſly conſulted the thermometer in the hot-houſe); and if the fire is conſuming too faſt, open the furnace-door accordingly; but if too ſlow, ſhut it cloſe altogether.

This method is much preferable to that of working by dampers, it being very difficult to hit on the exact proportion of the aperture to be left in the vent; beſides, whatever air paſſes through the vent muſt alſo paſs through the fuel, and that too with greater velocity than when the damper is not ſhut at all, ſince by the partial contraction of the vent the current will be increaſed.

In moderate weather, I have generally found two fires ſufficient for twenty-four hours; or rather, ſtrictly ſpeaking, a fire and an half: viz. a full fire, according to the ſeaſon and temperature the houſe is worked to, about four or five in the evening, and half as much at nine at night. In ſevere weather, three fires at moſt; viz. one at four in the evening, one at nine or ten, and one at ſix or ſeven in the morning. But here obſerve, that in this caſe, the furnace-door will generally require to be opened quite, after the fire is fairly kindled; as the flue will be kept conſtantly hot, by the ſlow ſoaking heat of the furnace. And this is none of the leaſt of the advantages which this furnace has over the other, as hereby the climate of the houſe is regulated, even in the moſt ſtormy weather, with a much greater degree of exactneſs.

By a ſmall variation in the conſtruction of this furnace, almoſt any kind of fuel may be uſed with ſucceſs. Turf and ſcreened cinders mixed in equal quantities make an excellent fire, and for which there need be no alteration made in this plan; but for turf or wood alone, the furnace ſhould be made at leaſt a third larger, and the grate conſiderably ſmaller.

Cinders, with a ſmall portion of coal, or charcoal of pit-coal, is certainly the kind of fuel to be preferred to all others; on account that it cauſes little ſmoke, and conſequently the flues keep the longer clean. It might therefore be proper, where there is a conſiderable extent of forcing, to collect or purchaſe cinders, or to have charcoal made on purpoſe.

Fig. 2. repreſents the Winter pruning of three vine plants, and part of a fourth and fifth, according to my method. (See Chap. V. Sect. V.).

Plate VI. repreſents the plan, ſections, and elevation of a green-houſe on an improved conſtruction for breeding young plants, and bringing them to an early flowering ſtate. See more on this ſubject in Chap. XI. Sect. I.

SECTION VI.

General Obſervations on the Conſtruction of Hot-houſes.

I Would recommend the greateſt ſubſtantiality in the conſtruction of all hot-houſes. The materials ought to be of the beſt kind, the wood well-ſeaſoned, and the workmanſhip *well* performed, in a plain and neat manner. The joiner ought to be very attentive in making true and handſome joints, otherwiſe he may expect them to grin in his face before the end of the firſt year. The painter, too, ought to be careful in the performance of his part; if the colour is not well prepared and carefully applied, it will ſcale off by the heat of the ſun in Summer. But in order to keep the wooden part of hot-houſes in good repair, they require to be painted on the outſide every ſecond year, and on the inſide every ſixth or ſeventh.

In glazing, I would ſeriouſly recommend crown glaſs, being far ſuperior to the common; it admits much more light in dull weather, and in ſunſhine allows of a larger portion of freſh air, and of keeping up the temperature at the ſame time, which is certainly a great object in forcing. Beſides, it is furniſhed as cheap as the common.

The price of the ſuperficial foot of glaſs varying according to the ſize of the ſquares, it is of importance not to make theſe too large; for inſtance, a ſquare which is twelve inches on the ſide, and which contains juſt a foot of glaſs, is ſold at tenpence; (I ſpeak of third crown); whereas, two ſquares eight and a half by eight and a half inches each, and which contains the ſame quantity to a mere fraction, is ſold at ſixpence halfpenny. So that the ſmaller the ſquare, the cheaper is the ſuperficial foot of glaſs; and this is occaſioned by the ſmall ſquares being cut from the broke or waſte of the large ones, which, if the manufacturer has no market for, he is under the neceſſity of re-melting.

From the above, I would not wiſh to infer that the ſquares ſhould be made too ſmall, as thereby the roof would not only be darkened by too many laps, but there would be too many aſtragals in the ſaſh, and, conſequently, the ſaving in glaſs might be more than counterbalanced by the price of the ſaſh-work. The panes ſhould be made perfectly ſquare, however, and that for the following reaſon:—I find they generally ſplit longitudinally, if not broke by accident; which is occaſioned by the wood, &c. ſwelling and contracting by the influence of the weather. The pane is not a whit the worſe; and, if it was perfectly ſquare at firſt, is as uſeful in the ſame place as ever, by being taken out and reverſed. For this purpoſe, the laps ſhould be made half an inch at firſt, and will now be a quarter, which is ſufficient.

I would here obſerve, that I diſapprove of the method of puttying up the laps in glazing, as thereby foul air is confined in the houſe. The hot-houſe as much requires a free circulation of freſh air at all moments, as the dwelling-houſe; nay, more ſo: Do not the flues make foul air in the houſe every moment they are at work?

Earthen flues, that is, flues whoſe walls are of brick, and covers of tile, are to be preferred to all others; as they keep the moſt conſtant and agreeable heat of any, and are alſo beſt adapted to the purpoſe of ſteaming, where required. The ſoles of the flues ſhould be ſupported from their foundations, in order that the heat may eſcape from under them, and be diffuſed through the houſe. A cavity of three inches is ſufficient for this purpoſe; but the wider the ſpaces between the *pillarets*, the better. Conſequently, where pavement-flags can be had, they ſhould be uſed; if not, large tiles ſhould be made purpoſely.

Where fire-brick and fire-clay can be procured, all hot-houſe furnaces, and about ten feet of the flue next to them, ſhould be built therewith. This is more expenſive at firſt; but in the end will be found to be a great ſaving, as they will laſt for many years without needing repair.

Neat wooden or leaden ſpouts ſhould be carried under the eaſing, and conducted to a ciſtern placed in ſome convenient part of the hot-houſe. No water is equal to that which falls from the heavens; and a very conſiderable quantity may be collected in this way.

In very wide houſes, it is cuſtomary to erect light wooden or iron pillars to ſupport the rafters, which are frequently a greater nuiſance than ornament. This is done, not altogether becauſe of the inability of the rafters to bear the weight of the ſaſhes; but becauſe the rafters fall down in the middle, which they would even do by their own weight, and obſtruct the free running of the ſaſhes, in the admiſſion of air, &c. There is a method of obviating this matter, and rendering the pillars uſeleſs; which, though very ſimple, is perhaps not generally underſtood, and therefore may be worth the relating.

Suppoſe the rafter nine inches deep at either end, let it be made ten in the middle, rounding it gradually away to the extremities; whereby, when it comes to ſettle, the ſurface will become perfectly ſtraight. This muſt be underſtood of the upper ſurface of the rafter and the ſaſh-beds, and not of the under ſide; which laſt will become roundiſh as it ſubſides. This is what is termed, "cambering the rafter."

In trelliſing, iron-wire is a great improvement, eſpecially when placed on the roof, as in Fig. 1. Plate III. It is not only more durable than wood, but is nearly as cheap at firſt, and is much lighter and neater. It ſhould be well painted, to prevent it from ruſting.

Hot-bed frames ſhould be made with ſcrew-bolts at the corners, in order that they may be laid up when not at work, which is a great preſervation to them. They generally experience more decay by being toſſed about and expoſed to the weather in Winter, than in all the time they are at work in Spring and Summer.

I ſhall conclude this Chapter by obſerving, that, where there is an extenſive variety of hot-houſes, it is not only more convenient, but alſo more elegant, to have them ſtanding in a range, than detached from each other. In this, uniformity ought to be ſtudied. For inſtance, if there is a green-houſe, place it in the centre; and the other forcing houſes in pairs, right and left, correſponding with each other reſpectively.

Although I have made the grape and peach houſes fifteen feet high each, and the pine-ſtove only twelve; yet, for the ſake of the above uniformity, the ſtove might be made of equal height with them; obſerving to raiſe the bark-bed in the ſame proportion, that the pine plants may not ſtand too far from the glaſs.

BOOK SECOND.

THE
FRUIT GARDENER.

CHAPTER I.

ON THE MAKING OF FRUIT-TREE BORDERS; PLANTING AND TRAINING FRUIT-TREES AGAINST WALLS, ESPALIERS, &c.

SECTION I.

On the Conſtruction and Situation of Garden-Walls and Eſpaliers.

THIS is a matter of great importance: A garden without ſhelter and a tolerably good ſoil, ſo far as reſpects the production of fruit, will remain, comparatively, a wilderneſs. Therefore, the greateſt care is neceſſary in the choice of the ſite of the garden; and it is frequently very difficult to find both a ſheltered ſituation and a kindly ſoil. The laſt object, however, in my opinion, ought to give way to the firſt, for the following reaſons:—In a complete garden, different kinds of ſoil are abſolutely neceſſary, particularly for the fruit-tree borders; and were the ſoil ever ſo bad, there is no difficulty in rendering it otherwiſe, in the ſpace of a few months; but where ſhelter is wanting, many years, even where the ſoil is good, are requiſite to the production of it, in a tolerable degree.

A fine * garden is certainly a great luxury; and ſurely nobody would be at the expence of building and planting one, who

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* The garden at Wemyſs Caſtle is placed in the middle of a plantation whoſe trees are an hundred feet high; for the ſite of which, and alſo the ſhrubbry, the whole ground was to clear. The half at leaſt of the ſoil now within the walls was brought from the fields. The fruit-tree borders were all entirely made, and generally cut out of the rock; none of which are leſs than a yard deep. This was done merely for the ſake of ſhelter; as there are ſituations hard by, where the ſoil is excellent, but without ſhelter. The garden was begun and finiſhed within ſixteen months.

who would not alſo wiſh to ſee it in perfection, and partake of its fruits. As, then, as it is preſumed, it will never arrive to that perfection in this country without ſhelter, which it may with it; it is ſurely preferable to lay down a garden in a ſheltered ſituation with a bad ſoil, to laying it down in an unſheltered one with a good ſoil; ſince the one may be remedied in a few months, and the other, perhaps, not in a lifetime.

The happieſt ſituation for a garden is, a gently elevated hill, having a ſouth, ſouth-eaſt, or ſouth-weſt aſpect, encompaſſed on all ſides with plantations at the diſtance of about one hundred yards from its walls. In this caſe, it ſhould be made a parallelogram, whoſe breadth is equal to two-thirds of its length, (according to the ſize required), extending in length from eaſt to weſt. This is not only the handſomeſt and moſt-approved form of a garden; but it gives greater length of a ſouth aſpect than when made ſquare. If the garden is very extenſive, it ſhould be equally divided by a wall running north and ſouth.

Between the fore-mentioned plantations and walls, ſhould be made a belt of low ſhrubbry, walk, and border; that the walls may be covered on all ſides with fruit-trees.

Brick is certainly the beſt material for the conſtruction of garden-walls; as being both better adapted to training, and of a more kindly nature for the trees, than ſtone: and where the wall is not entirely compoſed of brick, it ſhould at leaſt be *lined* *. But where theſe cannot be procured,

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* We have heard much of late, concerning the *propriety* of conſtructing garden-walls of brick: I have ſaid above, that *brick is certainly the beſt material.* I ſaid ſo, in my firſt edition of this work, five years ago; and from every obſervation I have made, in a pretty extenſive practice, I venture to hazard the ſame opinion now. That *black whin-ſtone* is the next beſt material, I am fully perſuaded: not altogether becauſe that *black* abſorbs heat more than any colour, having proved black bricks to be ſuperior; but that this ſpecies of ſtone is leſs porous than thoſe of the free-ſtone kinds. I have moreover found, that although brick is more porous than ſtone in general, and conſequently, abſorbs moiſture more readily; yet it alſo ſooner expels moiſture than ſtone of any kind. Perhaps, therefore, if we wiſh to arrive at the climax of perfection in this particular, we ought to put our garden-walls in mourning!

cured, and the wall is to be built of ſtone, it ſhould not be built in that rough, and irregular manner, which is too prevalent; but ſhould be neatly done in courſes of not more than ſix inches, and the ſurface in ſome meaſure ſhould be dreſſed with the iron, and rendered ſomewhat ſmooth for the trees being trained againſt, without the fear of having their bark ruffled in windy weather.

Much has been ſaid concerning copping of garden-walls: ſome adviſing that there be no projection; and others three, four, and ſome ſix, inches of projection; in order to throw the drip off the foliage. All which, in my opinion, is of no importance whatever. The quantity of rain that falls on a *two-foot wall* is but trifling; and does it not frequently happen, that the wind daſhes it againſt the tree ere it fall to the ground, in either caſe *?

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* A *temporary* copping of boards, projecting perhaps a foot, is certainly of infinite ſervice to the trees in the ſpring, while in bloom, in diverting or repelling the *perpendicular froſts*: But theſe froſts are leſs hurtful than *froſty winds*, which fall not perpendicularly. Therefore, as a complete remedy for both, I would adviſe the application of canvas ſcreens, or nets, as recommended in Sect. XI. of Chap. VIII.

The handſomeſt and moſt uſeful manner of copping is, to bevel off the ſtone to the thickneſs of two inches on each ſide of the wall, and give it as much projection; with a groove underneath, as is commonly practiſed.

The moſt eligible height for a garden-wall, and that which ſuits the generality of fruit-trees beſt, is fifteen feet; but where uniformity is ſtudied, the height of the walls ſhould correſpond with the extent of the garden, or rather with the apparent extent. However, I would wiſh the extremes to be fixed at ten and eighteen feet. I would be underſtood here, as ſpeaking of the height above the ſurface. And let it be obſerved, that no garden-wall ſhould be founded leſs than three feet, moſt kinds of trees requiring a yard of ſoil.

Eſpaliers are not only ornamental, but uſeful, in the garden, and are much to be preferred to ſtandards; which both overſhadow the crops, and are liable to be ſhaken with boiſterous winds, much to their detriment in the flowering and ſetting ſeaſons. But, being neatly dreſſed to a rail, many kinds of apples and pears will produce as well in this manner, as if trained to a wall.

Eſpaliers are generally, with the greateſt propriety, run parallel to the walls on the oppoſite ſide of the walk, and at the diſtance of three or four feet from it. They are alſo run on each ſide of the other principal walks which divide the garden, at the above diſtance from their edges; which, when well covered with healthy trees, form handſome avenues.

For a repreſentation of part of an approved eſpalier-rail, ſee Fig. 3. Plate II.

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SECTION II.

On the Breadth, Depth, and Compoſition of the different Borders, for Apricots, Apples, Cherries, Figs, Pears, and Plums.

BY the rules of proportion in laying out of gardens, the border ſhould be as broad as the wall is high; and the walk half as much. In this rule there is no variation, unleſs the wall is leſs than twelve feet in height, which, in my opinion, ought ſeldom to be the caſe; but if it is ſo, the border ſhould not be leſs. For eſpaliers, twelve feet is the medium breadth.

The depth for apricots, apples, cherries, and figs, ſhould be from two to three feet; that is, three feet at the wall, and two at the walk: and for pears and plums, four at the wall, and three at the walk.

If the ſituation is wet, and the bottom a cankering gravel or clay, which is far from being an eligible ſituation for a garden, drains muſt be run along the front of the border to the depth of the bottom, to carry off the wet; and a kindly bed muſt be made for the ſoil. This is moſt generally done by paving with ſtone or brick, but it is attended with an enormous expence; and if the bottom is not previouſly rendered quite dry by draining, it is of little uſe. Therefore, let the draining be carefully performed; and practiſe the following method in making a bottom: which will be found to be preferable to any pavement, and much leſs expenſive.—

Let the bottom be laid, in a ſloping manner, from the wall to the drain, having a fall of ſix inches. Firſt, lay two inches of good loam, of any kind, which ſpread ſmooth, and paſs the roller over; then, the ſame quantity of clean pit or river gravel, which alſo gently ſettle with the roller; over this, lay a ſecond courſe of loam, to the depth of an inch only, and likewiſe paſs the roller over it. All this muſt be done while the materials are in a pretty dry ſtate. But now the whole is to be made a little moiſt, and rolled till the ſurface becomes glazed; after which, water and roll alternately till it acquires a hard, ſhining conſiſtency, and the gravel is in a conſiderable degree appearing through the loam.

Thus will a bottom be formed, which no roots will penetrate, of a more kindly nature, and at a much leſs expence, than brick or ſtone.

The fitteſt compoſition for apricots, apples, cherries, and figs, is—three-fourths light ſandy loam, and one-fourth ſtrong clayey loam, mixed with a competent quantity of ſtable-dung, cow-dung, and marl, in compoſt; the apricots and figs requiring conſiderably more dung than the apples and cherries. For pears and plums—three-fourths ſtrong clayey loam, and one-fourth light ſandy loam, mixed well with compoſt, as above.

Yet I would by no means wiſh to infer, that of ſuch compoſition *only* ſhould fruit borders be made; it being clear to demonſtration, that trees thrive and produce fruit well, in different ſoils: but where the above materials can be procured, I would recommend a near conformity to this compoſition, breadth, and depth.

To follow this mode of preparing fruit-tree borders, it is neceſſary to claſs the different kinds of trees; that is, to keep the pears and plums by themſelves, and alſo the apples, cherries, &c. by themſelves. And this may eaſily be done, although ſome of each are placed on the ſame aſpect; it is only determining on the quantity and ſpace to be allowed for each kind, before preparing the border.

The compoſt ſhould be duly prepared before planting, by trenching and mixing it well two or three ſeveral times. And, in order to keep the mould in *heart*, a little well-reduced dung, or other compoſt manure, ſhould be digged-in each ſeaſon;

being careful not to injure the roots of the trees in the operation.

* * *

SECTION III.

On the different Kinds of the above Trees adapted to this Climate; the Aſpect they ſhould be placed in; and the Diſtance from each other, according to the Height of the Wall, &c.

THE following is a liſt for the walls, and the aſpect they ſhould be placed in; out of which, thoſe marked thus * are to be preferred.—But obſerve, I do not wiſh to dictate in this: every one has a right to chooſe the kind that ſuits his fancy, and to place it in the ſituation or aſpect in which it moſt likely will ſucceed.

Names.	Aſpect.
Apples.	
* Golden Pippin, - -	S.
Stone or Gogar do. -	S. E. W.
* Ribſton do. - -	S. E. W.
Newton do. - -	S. E. W.
* Balgon do. - -	S.
* Golden Rennet, - -	S.
* Golden Ruſſet, - -	S.
Royal do. - -	N. E. W.

Names.

Names.	Aſpect.
Apples.	
* Wheelers do.	E. W.
* Nonpareil do.	S.
Nonſuch,	N. E. W.
Hawthorndean,	N. E. W.
Apricots.	
* Orange,	S. E. W.
Roman,	S. E. W.
* Bruſſels,	S. E. W.
* Breda,	S. E. W.
Turkey,	S. E. W.
* More Park,	S.
Cherries.	
* May Duke,	N. S. E. W.
Arch-Duke,	S. E. W.
* Holeman's Duke,	S. E. W.
* Black Heart,	S. E. W.
* White do.	S. E. W.
Harriſon's do.	S. E. W.
Kentiſh,	N. E. W.
* Morella,	N. E. W.
Figs.	
* Blue Iſchia,	S.
* Brown do.	S.
* White do.	S.
Black do.	S.
* Black Genoa,	S.
Brown Naples,	S.

Names.

Names.	Aſpect.
Pears.	
* Jargonelle,	N. S. E. W
Summer Bergamot,	S. E. W.
* Autumn do.	S. E. W.
* Swiſs do.	S. E. W.
Orange do.	S. E. W.
* Ganſell's do.	S. E. W.
* Creſſane do.	S.
Chaumontelle,	S.
* Burie de Roy,	S. E. W.
Terling,	S. E. W.
Swan Egg,	E. W.
* Grey Achan,	N. E. W.
Colmar,	S. E. W.
St Germain's,	E. W.
* Green Yair,	N. E. W.
* Black Worceſter,	N. E. W.
Cadilac.	N. E. W.
Warden,	N. E. W.
Plums.	
* White Magnum Bonum,	S. E. W.
Red do.	E. W.
* Green Gage,	S.
* Yellow Gage,	S.
* La Royale,	S.
* Imperatrice,	S. E. W.

The following is a liſt for the eſpaliers; and, as theſe are generally equally and freely expoſed, may be placed indiſcriminately.—

Apples.

* Ribſton Pippin.
Kentiſh do.
* Oſlin do.
English Codling.
* Kentiſh do.
* Royal do.
Dutch do.
* Royal Ruſſet.
Wheeler's do.
* Summer Pearmain.
* Royal do.
* Loan's do.
Green Leadington.
* Grey do.
Yellow do.
* Summer Queening.
* Winter do.
* Yorkſhire Green.
Nonſuch.
* Hawthorndean.
Lady Wemyſs.
* Norfolk Beaſing.
Strawberry.
Purſemouth.

Cherries.

* May Duke.
Black Heart.
* Kentiſh.
* Morella.

Pears.

* Crauford.
* Jargonelle.
* Yair.
* Black Worceſter.
* Cadilac.
Warden.
* Achan.
Moorfowl Egg.
Drummond.
Summer Bergamot.
Scotch do.
Lammas.

Plums.

* Orlean.
* White magnum bonum.
Red do. do.
Drap d'Or.
* Wine Sour.
* Damaſk.

Out of which, thoſe marked thus * are to be preferred.

The following is what I eſteem a proper diſtance at which the above trees ſhould ultimately ſtand on the wall: but, as they will be many years in filling their ſpaces, and as in moſt kinds a few crops may reaſonably be expected before that time, riders of cherries, pears, and plums, may be placed between them.

For a wall twelve feet high:—the apples to be placed at twenty; apricots, thirty; cherries, twenty; figs twelve; pears thirty; and plums, twenty feet apart. And for a wall fifteen feet high—apples, fifteen; apricots, twenty-four; cherries, fifteen; figs, ten; pears, twenty-four; and plums, fifteen feet apart. And ſo in the ſame proportion for walls of any height from ten to eighteen feet, which, as I have already hinted, ought to be the extremes.

For eſpaliers:—apples, thirty; cherries, twenty; pears, thirty; and plums, twenty feet apart. But theſe ſhould be planted at double thickneſs, placing two of a kind together, that, in thinning them out, any of the kinds may not be extirpated.

Maiden trees, of all the kinds, ought to be preferred; and the ſeaſon for planting is, any time from the firſt of December to the firſt of March.

The Apples ſhould be choſen of ſuch as are worked on crab ſtocks raiſed from ſeed, and the Pears on free ſtocks, alſo raiſed from ſeed. Sucker-ſtocks of any kind are to be rejected, on account that they cauſe the plants to run much into unprofitable wood. The plants of all the kinds ſhould be clean, healthy, and well-rooted.

The pits ſhould be filled in with rich light mould, and that for all the ſorts without exception; as all trees are found to ſtrike root moſt kindly in light ſoil, although their nature may require a very different kind afterwards. Care ſhould alſo be taken not to place them too deep; if the ſtem is covered two inches higher than it was when ſtanding in the nurſery, it is ſufficient. It ſhould be placed two or three inches clear of the wall; for, if placed too near, that is, touching it, it has the effect of throwing the branches forward when they come to be of ſtrength; ſo that they are with difficulty kept properly dreſſed. To ſay that the *roots* of the plants are injured more or leſs by its being placed a few inches nearer to, or farther from the wall, would be abſurd; and yet this has been advanced.

Let them be ſettled with a little water, and duly attended to with that element in dry weather, the whole of the firſt Summer. Alſo, let a little mulch be laid round each of them; which will tend to keep their roots from being injured by the froſt in Winter, and the early part of Spring, and alſo from being ſcorched by the ſun in Summer.

SECTION IV.

On Training the different Kinds of the above Trees on Walls and Eſpaliers.

I. APPLES. THESE trees may be trained either in the horizontal or fan manner, with facility. But I prefer the fan manner, not only for them, but for all other trees planted againſt walls; for theſe reaſons, viz. We can make the tree fill its ſpace ſooner by one-third of the time, and can alſo ſupply the loſs of a branch with greater eaſe at any period of its age. But for Apples on eſpaliers, or on very low walls, the horizontal method of training is to be preferred; as the height of the eſpalier, &c. will not admit of fan training in a handſome manner. I ſhall, therefore, firſt treat of *fan-training*, as for walls, and then of *horizontal training*, as for eſpaliers.

Fan-Training.—After planting, let each of the ſhoots be headed down to three eyes, in order to make them puſh ſtrong, and furniſh the wall from the bottom; and when the young ſhoots have grown ſo long as to admit of being laid in, lay one on each ſide, that is, the loweſt, perfectly horizontal, and divide the intermediate ones equally at the diſtance of ten or twelve inches. In the Winter, ſhorten them all back to from one-half to two-thirds of their lengths, according to their ſtrength.

Next ſeaſon, they will puſh vigorouſly. The undermoſt ſhoots on each ſide are to be continued in a horizontal direction, as before; and the others ſhould be laid in at the diſtance of from nine to twelve inches, according to their ſtrength, and kind of the trees, ſome growing more groſs, both in wood and foliage, than others; and, in Winter, they are to be ſhortened back about one-fourth of their lengths on a medium. Whatever laterals appear on them at any time ſhould be inſtantly pinched off.

Next ſeaſon they will puſh ſtrong ſhoots; and many of the kinds will begin to ſhew fruit-ſpurs on the laſt year's wood. They will alſo puſh many ſuperfluous ſhoots; which muſt be pinched off at the ſecond joint, by the time they have grown to the length of eight or nine. Some rub off theſe as they appear; but as this frequently ruffles the bark, and thereby injures the tree, it is better to pinch them as above in Summer, and cut them clean off in the

Winter

Winter pruning: but if they puſh a ſecond time in the courſe of the Summer, they are, in that caſe, to be rubbed off as they appear.

Continue the undermoſt ſhoot on each ſide in the ſame horizontal direction, which is to be invariably done till the trees meet each other; and lay in the reſt at the diſtance of twelve inches on a medium. And, in the Winter pruning, ſhorten the ſtrongeſt and fartheſt extended ſhoots *only* a few inches each, and lay the others in at full length; unleſs it is neceſſary to ſhorten ſome of them a little, for the purpoſe of making ſhoots to fill any thin part.

This is forthwith to be done in the Winter prunings, never ſhortening for any purpoſe but that of filling the wall regularly; and the medium diſtance at which the branches are to be placed from each other, is nine inches in the ſmall, and twelve in the large growing kinds. At this time, alſo, are the ſuperfluous ſhoots, that were produced and ſhortened in Summer, to be cut neatly off; unleſs there be fruit-ſpurs formed, or forming on their under parts, which in many of the kinds frequently happens.

Next ſeaſon, moſt of the kinds will produce a few fruit, and will forthwith make more moderate ſhoots and plentiful fruit-ſpurs: and muſt henceforth be treated in all reſpects as for laſt year; obſerving to dreſs them neatly and regularly to the wall at all times, and diveſt them of the ſuperfluous and lateral ſhoots, as above directed.

Horizontal Training.—Young trees which have *three* ſhoots are to be preferred; but if there are but two, the weakeſt muſt be cut clean away, and the other retained, whereof to form the tree. But, for the ſake of brevity, I will ſuppoſe the tree conſiſts of three ſhoots.

After planting, let the middle ſhoot be headed down to nine inches; and let the two ſide ones be laid in at full length, in a horizontal and parallel direction, within nine inches of the ground, if poſſible; and if their extremities are anywiſe bruiſed, ſhorten them back a few inches, that they may puſh freely; but this is never to be repeated unleſs in like circumſtances.

When the young ſhoots are of ſufficient length, train that from the extremity of the principal ſtem or leader in an upright, and the two immediately below it, in a horizontal direction, right and left, and parallel to the two undermoſt branches of laſt year; which, as the ſtem was headed down to nine inches, will alſo lie at or about the ſame diſtance reſpectively. Produce the young ſhoots from the extremities of laſt year's branches in the ſame direction; and pinch off all the others, both on theſe and the ſtem, as directed for fan training.

As the horizontal ſhoots are never to be ſhortened unleſs their extremities are bruiſed by accident or hurt by the froſt; and as all ſuperfluous and lateral ſhoots ſhould be treated in manner as directed above; it may be unneceſſary to ſay more of theſe. I ſhall therefore confine my obſervations to the ſtem or leader.

As the branches are to be produced from the ſtem, and laid in (if poſſible) at the diſtance of nine inches on a medium; and as, in moſt kinds, more than two pairs cannot be produced each ſeaſon without running the riſk of irregularity; the ſtem muſt be headed down to eighteen or twenty inches, year by year, till the horizontal branches arrive at the top of the rail, &c. But this muſt be underſtood of apples in general, and that too when they are in a moderate ſtate of health and vigour; for ſome kinds, and indeed any, when in a luxuriant ſtate, will generally produce three pairs of ſhoots on the ſtem; which, in that caſe, muſt be left from thirty to thirty-ſix inches in length.

Great care ſhould be taken, when laying in the horizontal ſhoots which iſſue from the ſtem, that they be not ſplit away in the operation. I generally lay them in the manner they will beſt lie, till they are ſufficiently hardened to bear being laid in, in their proper poſition; and I likewiſe generally lay in or reſerve *all* the ſhoots that iſſue from the ſtem, till that time, (whether needful or not), in order to guard againſt accidents.

II. APRICOTS.—As theſe trees bear both on ſpurs and the young ſhoots of laſt year, fan-training is certainly to be preferred. Therefore, after planting, let them be headed down, and treated the two firſt years, in all reſpects as directed above for apples; laying the ſhoots in at the diſtance of nine inches on a medium. But this is to be underſtood of the principal branches: for when theſe trees arrive at a bearing ſtate, they frequently make fruit-ſpurs, or ſhoots of a few inches in length; which may alſo be ſuffered to lie at the diſtance of a few inches from each other. They alſo frequently make their fruit-ſpurs in cluſters: in which caſe, they are to be neatly thinned out; generally reſerving thoſe which lie neareſt to the wall, that the fruit produced on them may be benefited by its influence. Indeed, although ſpurs which ſtand at a diſtance from the wall frequently produce bloom in abundance, it is ſeldom the fruit ſets or comes to maturity on them: and therefore they may be conſidered as ſuperfluous ſhoots, and thinned away with them in the Winter prunings; unleſs they are ſufficiently long to admit of being laid in, and the ſcarcity of bloſſom on the trees renders this adviſable.

The breaſt wood produced in Summer is to be ſhortened back to two or three joints, as direćted for the apples; and alſo neatly cut away in Winter; unleſs bloom appear on them, which frequently happens if the tree be not in too luxuriant a ſtate.

In pruning of Apricots, the greateſt care ſhould be taken, at all times, to make clean and handſome wounds; and alſo to prevent bruiſes of any kind, either by the knife, hammer, or by nails bearing againſt the branches, which are of much injury to the trees, they being apt to canker and gum at the ſlighteſt bruiſe.

III. Cherries.—Theſe ſhould alſo be trained in the fan manner on the wall: and as all the kinds, except the Kentiſh and Morella, are apt to produce large cluſtered ſpurs when of age, and in a proper bearing ſtate, they are to be allowed a diſtance of from nine to twelve inches between the principal branches; obſerving to lay them in, and ſhorten them in the manner as direćted above for apples. The breaſt wood, laterals, &c. are alſo to be treated in the ſame manner at all times; and the ſame care is to be obſerved in reſpećt of wounds and bruiſes as hinted above for the apricots; Cherries, and indeed all kinds of ſtone fruit, being apt to canker and gum at every bruiſe.

The Kentiſh and Morella kinds, bearing principally on the young ſhoots of laſt year, they ſhould be trained much in the manner of peaches, (See Chapter VIII. Section IV.) and are to be laid in at the diſtance of ſix inches on a medium, diveſting them of all lateral and ſuperfluous ſhoots, as above.

On eſpaliers, I have ſeen the attempt made to train Cherries horizontally, but I never ſaw it accompliſhed handſomely; and would therefore adviſe fan-training, as above.

IV. Figs.—Theſe trees, bearing on the young wood of laſt year, being naturally apt to run upwards, and put forth ſuckers from the root annually, ſhould be trained in an upright manner reſembling that of the vine. The foliage being very large, they require to be laid in at the diſtance of a foot or fifteen inches between the young ſhoots: and as the diſtance between theſe is the principal object here, it is immaterial how near they lie to, or even if they cover or croſs the old ones. These trees are apt to grow to the extremities, and conſequently run into naked branches in the centre; a ſucceſſion of young ſhoots from the bottom ſhould therefore be conſtantly encouraged.

When the trees arrive at a bearing ſtate, which they generally will do in the courſe of four or five years, and as they ſhow the fruit which is to be ripened next year on the ſhoots of this; let ſuch as are not wanted for furniſhing any part of the tree with wood, be ſtopped about the middle or end of July: which will cauſe them to ſhew and ſet their fruit ſooner, and thereby be better eſtabliſhed before the Winter froſts ſet in, than when the ſhoots are ſuffered to grow late in the ſeaſon. On the open wall, this is of beneficial effect, though unneceſſary in a forcing-houſe.

V. Pears.—Theſe, of all others, do beſt, and make the handſomeſt trees, in the horizontal manner; but they will fill their ſpaces ſooner by a third, if not one half of the time, by fan-training, which is certainly a great object. On eſpaliers, however, horizontal training is moſt adviſable; and alſo on very low walls.

As I have been pretty explicit on both theſe methods in the firſt head of this ſection, it will be unneceſſary to repeat them here. I ſhall only, therefore, briefly remark any particular difference to be obſerved in the training of apples and Pears in either manner.

Moſt kinds of Pears being apt to make longer ſpurs than apples, the branches are to be allowed two or three inches more of room between them reſpectively: and as their ſpurs are alſo apt to grow more cluſtered than apples in general, theſe are to be more carefully thinned in aged trees; obſerving to retain ſuch parts of them as lie neareſt to the wall, in that operation.

As Pears are not ſo apt to ſhow fruit-ſpurs on the bottom-part of the breaſt-ſhoots ſhortened in Summer, as apples, theſe are generally to be cut clean off in the Winter pruning; thus giving the more room to the real ſpurs, and preventing a profuſion of uſeleſs and ſuperfluous ſhoots from riſing the following ſeaſon. This matter is but too ſeldom attended to in general.

As moſt kinds of Pears (eſpecially if in proper ſoil) grow more luxuriantly when young than apples; in fan-training, the leading branches, which require to be ſhortened for the production of ſhoots to fill the wall, may be left at greater lengths in general; and in horizontal training, the ſtem or leader may alſo be left ten or twelve inches longer in Pears than apples, as they will generally produce a pair more of horizontal ſhoots from it. The Jargonelle, however, ought to be an exception from this rule; as I have ſeldom found it produce more than two pairs of ſhoots from the ſtem, in a regular manner, annually.

VI. PLUMS.—Fan-training is alſo to be preferred, for the reaſons already given; nevertheleſs, they will make very handſome trees in general the horizontal way. In either caſe, they are to be treated much as already hinted; laying in the branches of the ſmall growing kinds at the diſtance of ſeven or eight inches, and the others at nine or ten apart.

The ſpurs in moſt kinds are apt to grow in cluſters, and at a conſiderable diſtance from the wall; which ſhould be thinned in the manner as directed for the apricots, as being nearly allied to them in their nature. In *fan-training*, the leading branches for the production of ſhoots to fill the wall, will generally require to be ſhortened about half their lengths, eſpecially in the ſmall kinds; and in the *horizontal* way, more than two pairs in the *ſmall* kinds, and three in the others, will ſeldom be produced from the ſtem annually; which, of conſequence, muſt be ſhortened to about ſixteen or eighteen inches in the one caſe, and to about twenty-four or thirty in the other.

SECTION V.

General Obſervations on Training and Pruning, and on Thinning and Gathering the Fruit, &c.

THE health and beauty of a wall-tree depends more on the regular arrangement of the young, than of the old wood; and conſequently, ſhould be neatly and regularly dreſſed at all times; but more particularly in the latter part of the ſeaſon; that every advantage may be taken in ripening, not only the fruit, but the ſhoots and ſpurs for the production of a crop the following ſeaſon.

We too frequently ſee theſe trees totally neglected in the latter part of the ſeaſon; particularly apricots, cherries, plums, &c.; which, when the crop is gathered, are generally no more thought of, or attended to: but this is very erroneous, as moſt of theſe trees grow a deal afterwards; and if the extremities of the ſhoots are not kept dreſt to the wall at this time, they will neither be ripened for the production of a crop, nor for enduring the winter froſts.

Great care ſhould be taken that no part of the branches be bound with the ſhred or tie, and that the heads of the nails do not bear againſt them; which, if they do, are ſure to induce canker. My rule is, to drive the nail rather in an oblique direction, inclining its head *from* the branch; and to allow as much room in the ſhred or tie as will at leaſt admit another ſhoot of the ſame ſize along with it; and alſo, never to drive nor ſuffer a ſingle nail or ſhred to remain on any part of the tree, that is not abſolutely wanted.

It is common to tie eſpalier trees with willow ſhoots; but I prefer tying with ſtrands of freſh matting. For I have often ſeen branches much injured by the willow ſhoots, when bearing hard againſt them, or if neglected to be cut away in the Winter pruning; theſe being of a hard wirey ſubſtance, and laſting over year. But in uſing matting, no danger of this kind need be apprehended; as the ſtrands are not only ſoft and pliable, but will not laſt above a year.

Winter pruning and dreſſing ſhould be performed in good time, that is, before the buds begin to vegetate; otherwiſe they are in danger of being rubbed off in the operation. In ordinary ſeaſons, apricots, cherries, pears, and plums, ſhould be finiſhed by the firſt, and apples and figs by the end of March.

In horizontal training, it frequently happens that the buds on the ſtem do not break regularly; and ſometimes a bud will remain in a dormant ſtate the firſt, and puſh the ſecond year; which if it does not, make an inciſion croſswiſe to the depth of the bark, immediately above it: it will not fail to puſh the following ſeaſon.

In what is termed a bark-bound tree, (in which caſe, it has a ſickly appearance in general, hard and ſhrivelled bark, makes weak ſhoots, with the leaves of a languid colour, and the ſtem and branches frequently covered with moſs), it is a good practice to rip the ſtem lengthwiſe, to the depth of the bark: but this is to be performed on apple and pear trees only; ſtone-fruit, from their aptneſs to gum, not admitting of this operation with propriety.

When a tree is in too luxuriant a ſtate, and does not ſet to fruit, the knife ſhould be uſed ſparingly, keeping it rather thick of wood (but regular) for a ſeaſon or two; and at the ſame time let a trench be dug round its ſtem, at the diſtance of four or five feet from it, ſo as to cut quite through all its roots. The check, which it thereby receives, will generally throw it into a bearing ſtate in the courſe of a ſeaſon or two.

In pruning, be careful to make clean and handſome wounds at all times; uſing the knife chiefly; but the ſaw in amputating ſtrong branches, and dreſſing the edges of the wound, thus made, ſmooth with the knife. In lopping branches from the ſtem, or twigs from larger branches, cut always in to the level of the bark, leaving no ſtub. And, if from the poſition of the wound on large branches, or on the ſtem, particularly in aged trees, there is reaſon to doubt its healing eaſily, let it be laid over with a little tar; which afterwards keep in a ſound ſtate, in order to exclude moiſture till the wound is quite healed, and ſkinned over with freſh bark.

It frequently happens, that after much pains has been taken in rearing and training a tree, it turns out to be of a very different kind from that for which it was planted: which is a great diſappointment, as perhaps it occupies a ſpace upon a much better aſpect than it deſerves; and were it to be removed, would occaſion an unſightly blank on the wall for ſeveral years, until a young tree filled its place. But, to remedy this, at leaſt in a conſiderable degree, it is more adviſable to ingraft or inoculate (according to the kind of tree) proper kinds upon its branches: in a *horizontal-trained* tree, near to the ſtem; and in a *fan-trained* tree, towards the bottom and lower extremities.

On the ſtems or branches of trees which have become naked of ſhoots through age, buds or grafts may be inſerted, in order to reſtore them to regularity; but if the tree is not in a healthy, clean ſtate, this labour would be in vain. In ſome caſes, if the tree in queſtion be of a good kind, it may be more adviſable to head it down entirely, that a ſtock of wood may iſſue from the bottom, afterwards to be trained regularly: obſerving, however, not to cut *below* the original bud or graft.

In this variable climate, our proſpect of a crop is frequently blaſted in Spring, while the trees are in bloom and ſetting, eſpecially in apricots, cherries, and plums. To ſecure which, canvas-ſcreens being applied, or nets ſuſpended, as directed in

Chap. VIII. Sect. XI. will be found of infinite advantage, and preferable to the common method of ſcreening with fir-boughs.

Apples, apricots, and pears, in favourable ſeaſons, are apt to ſet more fruit than the tree is able to ſuſtain, or ſhould be allowed to produce: the fruit ſhould therefore be regularly thinned; the apples and pears when about half grown, and the apricots when the ſtoning is fairly over. But, as no fixed rule can be given for this operation, the diſcretion of the gardener muſt be relied on; and the health and vigour of the trees muſt determine to what extent it is to be performed. In the More Park apricot, however, a fruit for every ten or twelve inches ſquare of the ſuperficial content of the tree, when in a healthy ſtate, will be a good medium. This, by many, is eſteemed the richeſt of all ſtone-fruit, when well ripened, and ate off the tree.

What I have ſaid in Chapter VIII. Section VIII., in reſpect of gathering peaches and nectarines, will equally apply here in reſpect of apricots and plums.

Jargonelle pears, and ſome of the kinds of bergamots, ſhould be ate off the tree, or at leaſt within twenty-four hours after being pulled, as they loſe much of their flavour by keeping. The other kinds of apples, and pears in general, ſhould not be gathered till their pips are of a blackiſh-brown colour, and they ſhould then be laid in the ſtore-room; which, for that purpoſe, ſhould be fitted up with ſhallow ſhelves, ſo as to admit of but one courſe of the fruit, and room for the hand.

Hence it would appear, that I diſapprove of what is termed *ſweating* of theſe fruits: —they generally retain an ill flavour ever after.

The greateſt care ſhould be taken to prevent bruiſes in theſe fruits, and they ſhould be frequently looked over and picked. The ſtore-room ſhould alſo be kept well aired, and ſecured from froſt.

SECTION VI.

On the Inſects which generally infeſt Wall-Trees; and how to deſtroy them.

THESE are, the green-fly, red-ſpider, caterpillar, grub, ear-wig, wood-louſe, and waſp.

The green-fly is eaſily deſtroyed by a fumigation of tobacco; but this is ſometimes performed with difficulty on open walls. My method is this:—Sprinkle the tree gently with water from the engine; then fumigate for the ſpace of eight or ten minutes with the bellows, when the vermin will be quite ſick; and afterwards give a hearty waſhing with the engine; by which means they are daſhed to the ground, which dig over in order to bury them. This operation ſhould be performed in a calm morning or evening; otherwiſe the ſmoke is immediately diſſipated, and, of conſequence, is the leſs effectual.

The red-ſpider and grub are kept under with the engine in Summer, and effectually deſtroyed in Winter by the *liquor*, ſee Chap. III. Sect. VII., which is to be applied in a milk-warm ſtate with the ſpunge, as there directed. It muſt alſo be applied at leaſt a month before the buds begin to vegetate.

For enſnaring and catching the ear-wig and wood-louſe, the following is my method :—Take a quantity of water reeds or ſtrong wheat ſtraw, and cut them into lengths of five or ſix inches; place them all over the ſurface of the tree, between the branches and wall, allowing two or three to every ſquare yard; alſo lay a quantity on the ground at the bottom of the wall. In theſe the inſects take ſhelter ſo ſoon as the morning ſun appears on the ſurface of the wall; which, in an hour or two after, are to be blown into a bottle having a little water in it, replaced as before, and this ſhould be repeated every morning in the ſame manner till they are quite eradicated; which will generally be very ſoon accompliſhed, as they may be taken in vaſt quantities in this manner.

The only ſure method of keeping the waſps under, is by deſtroying their neſts *; but in rugged and rocky places this is not eaſily accompliſhed. They are alſo enſnared

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* See Chapter V. Section X.

red in great quantities by placing phials filled with honey and water, or ſugar and ſmall beer, againſt the walls; alſo, by ſuſpending ſmall ſticks covered with birdlime, over which a little honey and water is poured at times.

The green-fly preys moſt on the peach, plum, and cherry; the red-ſpider on the apple, cherry, peach, and plum; the grub on the apricot and cherry, and ſometimes on the apple and pear; and the ear-wig, wood-louſe, and waſp, on the fruits ~~of all~~.

Waſhing with the garden engine is of infinite ſervice to wall-trees, and ſhould be frequently performed in dry weather in the Summer months: it both refreſhes, and keeps the trees clear of duſt, &c., and alſo tends, in a great meaſure, to ſuppreſs inſects of all kinds, particularly the red-ſpider.

Waſhing the ſtem and branches of trees, which are anywiſe moſſed, with ſoap-ſuds and ſulphur, is alſo of great utility, and ſhould be performed in Winter or early in the Spring; previouſly rubbing off the moſs with the hand, and bruſhing the branches clean with a bruſh, ſuch as is uſed for cleaning of plate, &c.

CHAP-

CHAPTER II.

CULTURE OF ORCHARD FRUITS.

SECTION I.

On the Situation *for Orchards.*

ORCHARDS in this part of the united kingdom (Scotland) are an object of trivial concern at preſent; for, excepting thoſe of Clydeſdale, ſome in the Carſe of Gowrie, and a few near Jedburgh, there are none of any note. It is certain, we (in Scotland) need not expect to cope with our ſiſter country, in this reſpect; but it is equally certain, there is a poſſibility of imitating, and even nearly approaching her, in the productions of the Orchard; or at leaſt ſo far as to anſwer the conſumpt of the country, in good ſeaſons.

The productions of thoſe in Clydeſdale, which in ſome ſeaſons is aſtoniſhing, are a proof in point, and theſe are neither extenſive, nor (excepting one) even kept in tolerable order. They are, however, capable of very great improvement, and with little expence and labour might be rendered productive in treble or quadruple proportion, *on an average of years.*

Their ſituations, and indeed the whole bank of the river, from the Falls of Clyde to Hamilton, and thence to Bothwell Caſtle, &c. are ſo peculiarly adapted to the purpoſe, that I am convinced the proprietors could not occupy their land in any other way that would give a fourth of the return. The banks are in general ſteep, and in many places inacceſſible to the plough; and theſe very *ſteeps* are beyond all other ſituations deſirable for that purpoſe, eſpecially thoſe on the north ſide of the river, being expoſed to the ſun, the banks reflecting his rays, and rendering the ſituation in ſome degree as if the trees were planted againſt a wall.

In this tract we find many acres covered with broom, bramble, bruſhwood, &c. which at preſent do not bring the proprietors, perhaps, ten ſhillings an acre; and which are ſo admirably ſituated, and the ſoil ſo congenial, that were they converted ed into orchards, might, in a few years, bring *fifty pounds* on an average *.

This peculiarity of ſituation is not confined to Clydeſdale. There are many other dales in Scotland equally well adapted to the purpoſe. But dales, and thoſe through which a river meanders, are to be choſen in preference to all other ſituations: *Becauſe*, firſt, their banks afford ſhelter from the winds by their frequent windings and turnings; ſecondly, their ſteep ſides confine and reflect the rays of the ſun, whereby the climate is rendered more mild and warm than in other ſituations; and, thirdly, there is a conſtant vapour or effluvia ariſing from the river, which is particularly grateful to the trees while in bloom and ſetting; and alſo tends to *ſoften the climate* at that ſeaſon of the year, which is frequently inimical to the ſetting of fruit in other ſituations.

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* There is a proof of more than I ſay, on the ſpot lately improved by Mr Harvey of Brownlee: it is a very ſteep bank, was overrun with bramble, briar, &c. and does not contain above an acre and an half, the far greater part of which is not yet arrived at a full bearing ſtate; yet, this ſpot for ſome years back, has produced from ſeventy to *one hundred pounds* a year to the proprietor, who, as an *improver* in this, as well as many other reſpects, is a Gentleman of much merit.

In this caſe, the moſt deſirable ſituation is the North, Eaſt, or Weſt bank *, from the verge of the river (including the haugh or holm, if ſuch there be) to within a few yards of the termination of the bank, more or leſs according to its ſteepneſs, ſo that the trees, when full grown, may be *within its level*, and thereby be ſcreened from the Northern and other prevailing winds.

The haugh or holm on the oppoſite ſide of the river, and alſo the banks, if not very ſteep, in many caſes may anſwer very well; but if the bank is very ſteep, and the ſoil not particularly inviting, its occupation as an orchard will be attended with inferior ſucceſs.

Many dales without a "river meander-"ing," may alſo prove excellent ſituations; and many ſpots *in any dale* may prove more ſo than others; which may be occaſioned by the ſuper-excellence of ſoil, congeniality of ſubſoil, peculiarity of expoſure,

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* Suppoſing the river to run parallel to any of theſe aſpects, or to any aſpect from Eaſt to Weſt.

ſure, eaſe of acceſs, happineſs of ſhelter, &c. But,

Unſheltered plains are ſituations, where ſucceſs in rearing and bringing orchards to a ſtate of maturity, will ever be precarious in this country.

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SECTION II.

On the Soil for Orchards.

THE ſoil *moſt properly* adapted to apples, is a brown loam of a middling texture, and which is at leaſt eighteen inches deep, over a bottom of dry ſand, gravel, or ſoft clay; in which they are found in the higheſt health, and of greateſt durability. Nevertheleſs, they will do well in many ſoils, ſuch as ſandy loams, gravelly loams, chalky loams, clayey loams, &c. which are of various depths, and which are alſo incumbent on various ſubſtrata, as chalk, limeſtone, dry rock, ſand, clean gravel, &c. But if the bottom is wet, and the ſubſoil a till, retentive clay, or irony gravel, clay, &c. little good may be expected of them for any length of time, if the upper ſoil be ever ſo good.

That *moſt properly* adapted to Pears, is a ſtrong clayey loam, a yard in depth, over a bottom as above. The ſame exceptions as above, are alſo to be conſidered.

Cherries and Plums are of little importance compared with Apples and Pears, being of no uſe whatever, unleſs there is an immediate conſumption for them, from the circumſtance of their *not keeping*. The ſoil which anſwers Apples and Pears, will anſwer Cherries and Plums reſpectively, and equally well.

It would be vain to attempt rearing an orchard, where the bottom is not either naturally dry, or is previouſly rendered ſo by draining; and this is to be obſerved in all caſes and ſituations whatever.

This reflection more naturally occurs in reſpect of flat or hollow ground, than otherwiſe; but it is as frequently neceſſary on ſteep banks, which are often interſperſed with ſpouty or ſpringy ſpots, occaſioned by the different ſtrata of which the higher ground is compoſed. To enter, however, into a ſyſtematic mode of draining, would be foreign to the ſubject here; and the reader is referred to Mr Elkington's, as explained by Mr Johnſtone; being at once the moſt effectual and leaſt expenſive method.

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SECTION III.

On the Kinds of Manure fit for Orchards.

ORCHARD ground ſhould be moderately enriched with the kinds moſt properly applicable to the ſoil. Compoſt is to be preferred to ſimples.

If the ſoil is of a cold nature, a compoſt of lime, ſtable-dung, pigeon-dung, ſoot, aſhes, &c. is to be adviſed; if light and hot, cow-dung, hogs-dung, loamy marl, pond-mud, ſcouring of ditches, &c.; or, as ſimples, any of the kinds which is beſt calculated to correct or enrich the ſoil. Marls are *eminently* uſeful, and, in general, are to be preferred to lime, being leſs apt to canker the roots of fruit-trees.

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SECTION IV.

Of the Kinds of Orchard Fruits.

THE kinds in cultivation at preſent, in my opinion, are too numerous. They are alſo very indiſtinct, being confuſed and miſconſtrued, by the many provincial names which are given for the ſame fruit. He who plants an orchard, has the undoubted right of indulgence in this reſpect. The following liſt is given as the one which I would adopt, were I in the predicament, preferring thoſe marked *, viz.

Apples.

* Ribſton Pippin.
* Oſlin do.
* Royal Codling.
Kentiſh do.
Dutch do.
* Royal Ruſſet.
* Royal Pearmain.
Loan's do.
* Summer do.
* Golden Rennet.

Apples.

Kentiſh Rennet.
* Leadington.
Summer Queening.
Winter do.
* Yorkſhire Green.
Margill.
Nonſuch.
* White Hawthornden.
* Norfolk Beaſing.
Strawberry.

Pears.

Drummond.
* Longueville.
* Jargonelle.
Lammas.
Crauford.
* Green Yair.
* Achan.
* Scotch Bergamot.
Summer do.
Worceſter.
Cadilac.
Warden.

Cherries.

* May Duke.
* Black Heart.
* Kentiſh.
* Morella.

Plums.

* Wine Sour
* Orleans.
* Green Gage.
* Blue do.
* Yellow do.
* White & Red Mag. Bon.
* Damaſk.

SECTION V.

Culture.

BEFORE planting, the ſoil is to be trenched to its full depth; and the manure well incorporated with it in the operation.

Maiden trees of all the kinds are to be preferred, having boles of three or four feet in length, the apples being worked on crab, and the pears on free ſtocks. The diſtance at which they ſhould ultimately ſtand is, thirty feet either way, for Apples and Pears. For Plums and Cherries, ſix feet leſs reſpectively.

As I by no means approve of *a mixture of crops*, or even of an under crop as a reimburſement for preſent expence, I would adviſe planting four trees for one that is to ſtand for good; that is, at fifteen feet each way for Apples and Pears, and at twelve for Plums and Cherries. Three of theſe muſt be conſidered and treated as temporary trees from the beginning, and ought to be choſen of the leaſt durable, and at the ſame time, ſooneſt bearing kinds; ſuch as the Nonſuch and Hawthornden apples; Crauford and Yair pears; May Duke and Morella cherries, &c. which may be interſperſed as *temporaries* amongſt all kinds without diſcrimination.

The ſeaſon for planting is from November to March, with equal ſucceſs. The pits ſhould be filled in with light compoſt of earth and manure, for all kinds, except the Nonſuch Apple, which is moſt durable, and alſo generally moſt fruitful without manure at any time; wherefore, in the annual dreſſing, manuring, &c. this tree is to be an exception, ſo far as not to injure the others by its treatment or neglect.

If the firſt Summer proves dry and hot, let the trees be frequently watered; and, in order to retain the moiſture, let a little dung or other litter be kept round them on the ſurface.

The only indulgence which I would ſubſcribe to, in reſpect of an *under crop* is, a ſingle row of Beans, Cabbage, Carrot, Peas, Potatoes, Turnip, &c. in the centre between the trees, and that only for a few years, and with a view of defraying the expence of hoeing and keeping the ground clean of weeds, &c. which is invariably to be done for the firſt ten or twelve years, or till the temporaries are removed. By this time the principals will be ſo far eſtabliſhed in the ſoil, and advanced in ſtrength and ſize, that the ground may ſafely be laid down in graſs, ſo to remain, that their roots be no further diſturbed for ſeven or eight years; after which, it is to be periodically broke up every fifth or ſixth, and moderately manured.

Previous to this, let a moderate quantity of manure be digged in every ſecond year, obſerving to dig deepeſt, and apply moſt of the manure *beyond* the extremities of the roots, thereby preparing *food* for them as they advance.

The criterion for relinquiſhing the practice of *under cropping*, is, when the roots of the trees reſpectively come into contact.

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SECTION VI.

On Pruning, &c.

JUDICIOUS pruning is of the utmoſt conſequence, both to the welfare of the tree, and to the production of beautiful and well-ſized fruit. That old trees produce diminutive fruit, is not, perhaps, altogether becauſe of their *age*, but becauſe of the want of judicious and timely pruning; and as old, or at leaſt eſtabliſhed trees, are the ſureſt bearers in general, it is *ſubject of regret* that ſo many inſtances are found of total neglect in this particular. In all the Clydeſdale orchards, there is *not one tree in fifty* in proper order in this reſpect.

From the day the tree is planted, to the day in which it is no longer ſuffered to "encumber the earth," it ſhould undergo an annual *viſitation* of the "pruning hook," which ſhould be in the hand of one "who knoweth the fruitful and profitable branch, from the unfruitful, and that which is naught, and periſheth."

This operation, however, is to be performed with caution and moderation, eſpecially on young trees; as too free an uſe of the knife is attended with the conſequence of too great a profuſion of young ſhoots the following ſeaſon. The tree ſhould be kept moderately thin, and free of branches croſſing one another, endeavouring to have every part of it regular, and fanned out towards the extremities; alſo, thinning out the cluſtered ſpurs (as in many kinds they form too thick) regularly, and cutting out ſuch as are rotten, bruiſed, &c.

Let the temporary trees be thinned away, as the principals advance towards each other, and, by the time their extremities meet, let them be entirely ſtubbed up.

In aged trees, which have been neglected, and are too thick of wood, ſpurs, &c. the pruning *ſaw* and *knife* ſhould be uſed with freedom at firſt, and that in every part of the tree, without diſcrimination of fruitful or unfruitful branches.

By the judicious performance of this operation, it is incredible in what aſtoniſhing degree a tree will *renew its age;* and will forthwith for many years flouriſh, and produce excellent crops of fruit.

The ſeaſon for performing the above operations, is any time from October to March, but after that time it is not adviſable to handle fruit-trees, as the buds then begin to vegetate, and are eaſily diſplaced.

It is no uncommon thing to ſee apple, pear, and plum trees, &c. in a great meaſure deſtroyed by *moſs.* This is moſt generally occaſioned, by the roots having *touched a cankering bottom;* but it is alſo frequently occaſioned by the tree being kept too thick of wood, and conſequently of foliage, which confines ſtagnant air about its branches, in dull hazy weather. It is of leſs *bad* conſequence, if this is confined to the trunk, or ſtrong branches only; but if the extremities and fruit-ſpurs are affected, the juices will be obſtructed in their circulation, and conſequently the fruit will be more immediately injured.

Therefore the moſs ſhould be rubbed off every pruning ſeaſon, and the branches and ſpurs ſhould be anointed every ſecond or third, with a ſolution of ſulphur and ſoap-ſuds, in the following proportion, viz. one pound ſoft ſoap, one pound flowers of ſulphur, ſix gallons river or rain water, boiled all together for half an hour—applied when milk warm with a ſpunge.

If the trees are afflicted with the caterpillar, or grub, which is frequently the caſe, the liquor, ſee p. 62, muſt be uſed inſtead of the above, being careful to anoint the *eyes of the buds*, as it is *there* the eggs of the inſects are chiefly lodged, whence they iſſue with the young ſhoot, and incloſe themſelves in the leaves, on which they feed, or perforate to the very great injury, and frequently the total deſtruction of the foliage; and conſequently to the detriment and ultimate ruin of the tree.

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SECTION VII.

Of CATTLE *in Orchards.*

IT is a prevalent cuſtom to *paſture* in orchards.—I diſapprove of the practice. It is too frequently the cauſe of total neglect of the *fruit;* the trees being often left unguarded, and conſequenly much damaged by the cattle browſing on the branches, and rubbing themſelves againſt the boles.

Paſturing of ſheep is attended with equally bad (if not worſe) conſequences; as nothing is more pernicious than the oil or greaſe, which exudes from their wool, in rubbing themſelves; which, if often repeated on the ſame tree, and this is almoſt always the caſe, this animal inſtinctively following example, more than any other, has the effect of completely cloſing the pores of the trunk ſo rubbed, much to its detriment.

But I have other objections than theſe to this practice, viz. *1ſt*, Until the trees have been about fifteen years in the ground, are well eſtabliſhed, and the temporaries are all removed, the ground ſhould *not* be laid down in graſs. *2dly*, If planted with the view of being an *Orchard only*, the trees will neceſſarily ſtand ſo thick, and the herbage be ſo much ſhaded, that it will be of little value, and of very bad quality for paſture. *Laſtly*, I conſider it as being prejudicial to the roots of the trees, particularly in ſtiff wet ſoils, to be pent up in the earth, and retarded in their annual progreſs by the weight and conſtant treading of the cattle.

Wherefore, I would rather adviſe, that the under crop be uſed as *cut graſs*, (which generally comes very early), and this is found to pay better than paſturing; the firſt cutting, which is always had before the trees are full in leaf, being equal to the whole value of the paſture.

SECTION VIII.

On the Cultivation of SMALL FRUIT.

THE method of planting ſtandard Fruit-trees, to divide the quarters of the kitchen-garden, is now juſtly exploded. They are found to injure the under crops *much*. The method of planting currants and gooſeberries round the edges, and to ſubdivide the kitchen-garden, is alſo juſtly exploded; and they are now generally planted in quarters by themſelves: ſo are raſpberries and ſtrawberries.

And thus an opportunity of changing crops is afforded, as the beſt method is to make new plantations of ſtrawberries every fourth or fifth year; and of currants, gooſeberries, and raſpberries, every ſeventh or eighth. The three laſt named, having much the ſame effect on the ſoil, may not take place of one another with propriety; but may with ſtrawberries, and alſo ſtrawberries with any of them.

The ground ſhould be trenched, and moderately enriched with any of the kinds of manure moſt properly applicable to the ſoil; which, for currants, gooſeberries, and raſpberries, if not a perfect ſand, cankering gravel, or wet, ſtubborn clay, will (with proper culture) produce them abundantly. Strawberries are an exception. They are moſt productive of fruit,-and leaſt ſo of ſtraw, on a ſtrong loam, and in an open expoſure. Neverthele∫s, we find them prolific, with proper culture, in many different ſoils.

If the ground is broken out from graſs, let the turf be chopped well; bury it in the bottom of the trench, and the manure one ſpit deep. If from ground which has been under tillage or kitchen crops, bury the one-half in the bottom, and the other at one ſpit deep; obſerving to divide and break the ſoil well in the operation.

The methods of producing young plants of all the kinds being univerſally known, it would only be waſting time in ſaying more in that reſpect, than that they ſhould be clean, healthy, and well rooted.

To enumerate the kinds would be an endleſs taſk, particularly of gooſeberries; nor would it be at all ſatisfactory, almoſt every one having their favourites. But it cannot be doubted that the *rage* for multiplying the varieties of this fruit has been carried too high of late years; and that many of our old kinds far excel the new ones, in reſpect to flavour.

Currants and Gooſeberries

Should be planted at from four to ſix feet apart each way, according to the quality of the ſoil. The ſeaſon is any time from November to the firſt of March.

Currants and gooſeberries produce both on ſpurs, and on the ſhoots of laſt year; but the fruit on the latter is always largeſt. Therefore, the ſhoots to be retained ſhould be left at full length; and the plant ought to be regularly thinned out, leaving theſe generally at the diſtance of from nine to twelve inches apart, and twiſting off all ſuckers, &c. from the root, which take greatly from its ſtrength.

Gooſeberry plants, in particular, ſhould be kept free and open in the middle; nor is a Winter pruning ſufficient; but they ſhould have a Summer dreſſing alſo, when the ſuperfluous ſhoots are to be rubbed off. This, however, is not ſo neceſſary for currants. Indeed, they generally ſwell their fruit larger if ſhaded in a moderate degree, though it muſt be allowed the flavour is not ſo high, as when the plant is kept more open and free of luxuriant ſhoots.

Some gooſeberries are of the weeping kind, and when heavy laden, the fruit is frequently much injured, and even daſhed off by the branches dragging on the ground. To prevent which, a hoop ſhould be faſtened to ſtakes or pegs drove into the ground, and at the diſtance of a foot from it; to which let the branches be dreſſed in a regular manner.

Raſpberries

Are alſo to be planted at from four to ſix feet apart each way, according to their kind, and the quality of the ſoil. In good land, the Antwerp kinds require at leaſt ſix feet: the common, a foot or two leſs, as they do not grow ſo luxuriantly. I have ſeen a quarter of *Antwerps*, which averaged ten feet in height each ſhoot, and proportionally ſtrong; ſome of which girted above three inches. They grew in a mixture of peat-earth and ſandy loam of conſiderable depth.

Raſpberries bear entirely on the ſhoots of laſt year, which are plentifully produced from the root every ſeaſon. In Winter dreſſing, the old ſhoots are to be cleared away, and alſo the major part of the new, retaining three or four of the ſtrongeſt only, otherwiſe the plant would become a perfect buſh next ſeaſon.

The moſt ſimple, and beſt mode of ſupporting them is, by twiſting the ſhoots looſely together, and tying the extremity with a piece of ſpun-yarn, or ſtrands of freſh matting.

Strawberries

Are to be planted, either in July or Auguſt, or in March or April, according to the forwardneſs of the ſeaſon, in rows from twenty-four to thirty inches aſunder, according to the kinds and quality of the ſoil, and at from ſix to eight inches in the row; kept clean of weeds at all times; the ſtraw cut in October; the rows rutted on each ſide, left ſix inches broad, and the intervals dug a full ſpade deep. A ſlight dunging each ſeaſon, or a good one every ſecond, will be ſufficient to keep the land in heart.

Where the ſituation is particularly inviting, and (which ſometimes happens) the culture of any other crop would be attended with *more* difficulty; ſtrawberries may be ſucceſsfully continued on the ſame ſpot for many years, by reverſing the rows and intervals every third ſeaſon.

This is attended with no manner of trouble, the runners planting themſelves. But when new plantations are to be made, ſuch runners, after having ſtruck root in July or Auguſt, are the fitteſt plants for this purpoſe, and ſhould then be tranſplanted.

It is obſervable, that ſtrawberries planted in manner as above, that is, in *rows*, are much more prolific of large fruit, than when planted *thick* in *beds*. In ſingle *detached rows*, they are ſtill more ſo; and are with propriety run round the alleys of the kitchen-garden, in the double character of edgings, "ornamental and fruitful."

Some, who are ſanguine of the produce of their ground, introduce kitchen-crops of all kinds amongſt their currants, gooſeberries, and raſpberries, and frequently with too little diſcrimination of which is the *intended* crop. Why are they planted by themſelves at all? Is it not that they may be produced in the greater perfection? If ſo, why with open eyes thwart the original intention, by robbing the ground with burdenſome crops of vegetables?

Nevertheleſs, I wiſh not to ſee an inch of land loſt. There is certainly a medium. A ſingle row of beans, broccoli, cabbage, cauliflower, carrot, turnip, potatoes, &c. in the centre between the currant-trees, &c. being ſown or planted, would be conform to ſtrict prudence. And here they would be of the very beſt quality, if the ſoil were congenial to their natures, as they would have full room to extend.

I have ſeen excellent vegetables produced in this manner; but at the ſame time have ſeen much injury done the fruit, by its being too long perſiſted in. Till the fourth year, it may be practiſed; but not longer. Indeed, there would little (perhaps no) profit attend the practice after this time, as the fruit would ſuſtain more injury than the value of the vegetables would indemnify; and theſe laſt would be leſſened in value, by being overſhadowed by the trees or buſhes.

BOOK THIRD.

THE
KITCHEN GARDENER.

INTRODUCTION.

NECESSITY, which is juſtly ſaid to be the mother of invention, is the firſt and grand ſtimulus to induſtry. Hence the cauſe, why the northern nations are farther advanced in the arts of gardening and agriculture than the ſouthern, moſt probably is, that the ſoil and climate are generally leſs favourable, and conſequently leſs productive of the neceſſaries and comforts of life.

As commerce extended, and mankind began to have more intimate intercourſe with one another, not only their *real* but imaginary wants were mutually diſcover-

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ed, and the means of gratification employed. The progreſs was long *ſlowly progreſſive* in our iſland; but now a ſpirit of uſeful improvement hath manifeſted itſelf in all orders of the community, unknown to other ages. The branches of gardening and agriculture have made rapid progreſs; but an ample field is ſtill left open, in which the ingenious and induſtrious may diſplay their talents and perſeverance.

The various modes of raiſing food for man, by cultivating the earth, are to be comprehended under the two general heads, Gardening and Agriculture. Theſe go hand in hand, being nearly allied to one another; the chief conſtituent difference being in the implements uſed, and the manner of employing them. In the one, the labour is chiefly manual; but in the other, the far greater part is performed by aid of cattle.

The plough is a moſt uſeful inſtrument, but it is not ſo efficacious on a ſmall ſcale as a ſpade. Hence the ſuperiority of the garden over the field, in reſpect to the ſuperabundance of its produce.

The more we do for the ſoil, the more

grateful will it be in return; and prudence, as well as intereſt, ſhew the neceſſity of ſkilful induſtry, whether in gardening or in agriculture, and ſpur on to improvement.

A juſt knowledge of the value and effect of manures, their application, the quality, nature, and pulverization of the ſoil, is the grand baſis of agricultural improvement, and lead to all ſubſequent diſcoveries. Theſe can be more minutely followed in gardening than in agriculture, and alſo with leſs riſk of diſappointment. Hence have the diſcoveries and improvements in gardening generally been the forerunners of thoſe in agriculture.

Inaſmuch as not only garden vegetables, but grain, produce moſt abundantly on what is termed *new land*, effectual plowing, digging, trenching, &c. would appear to be of the utmoſt importance. This matter is ſuſceptible of being more effectually performed in gardening than in agriculture, and is another reaſon why the garden is more productive than the field.

A third reaſon, in ſome inſtances, may be local ſituation, ſhelter, &c. But this does not always hold good, as many kinds of vegetables, particularly thoſe moſt uſeful, are found to do as well, if not better, in an *open* field-garden, than in one which is *ſheltered.*

Garden land is generally higher rented than that of the farm; a much ſmaller quantity is appropriated to the maintenance of a family; the occupier is under the neceſſity of uſing all diligence, induſtry, and perſeverance; and of working and manuring his ground to the utmoſt of his ability in the hope of a return. Thus may another reaſon be deduced why the garden is more productive than the field. And, laſtly,

Private gardens, being both an object of utility and amuſement to the proprietor, are generally placed in the moſt favourable ſituations, well kept, manured, &c.

Nevertheleſs, the efforts of the moſt ſkilful, in the culture of the more tender eſculents, are often baffled; more eſpecially if his ſoil be not congenial for the purpoſe. And who is he that can withſtand all the caſual occurrences of weather, and viciſſitudes of a variable climate? In fine, gardening and huſbandry, labour under many diſadvantages in this country, unknown on the continent, particularly in the earlier part of the ſeaſon. Not ſo much that the weather is *more* ſevere, which indeed may be queſtioned, but that it is *more* changeable, and that we are leſs favoured with the viſits of that refulgent luminary, the firſt ſtimulus, the very *eſſence* of vegetation.

To remedy, then, as far as may be in our power, the diſadvantages under which we labour, let us endeavour to render the climate more ſalubrious by the *high cultivation* of every ſpot of ground, in whatever way it may be employed; which unqueſtionably hath a good effect, and goes far towards the attainment of this deſirable object.

Draining comes firſt in point. For, while latent water remains in the body of the ſoil, we may deſpair of ever rendering it productive, in a ſuperlative degree, of either vegetables *, grain, or timber. And happy is it for this country, that *now* a method of performing this frequently neceſſary operation, is diſcovered and divulged to the world, than which, perhaps nothing could be a more valuable acquiſition.

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* According to the general acceptation of the word; for *vegetables* embraces the *whole* of one of the kingdoms of nature.

The reader will probably perceive, that I allude to Mr Elkington's, as explained by Mr Johnſton. He is referred to it.

Next to this, effectual ploughing, digging, trenching, incorporating, and aërating the ſoil, would ſeem to ſtand forward and demand our particular attention. Let us beſtow it. Let us not exhauſt one part of the ſoil, while another remains in a ſtate of inactivity, and is, perhaps, at the ſame time equally capable of production. But rather let us bring up what probably has never, or at leaſt for years paſt, been accuſtomed to the dividing *rutt* of the *coulter*, the penetrating *thruſt* of the *ſpade*, and conſequently, the produce of "food for man and beaſt;" and which, by being freſh and unexhauſted, may afford a timely relief to that which is the contrary, overburthened, perhaps, by long and ſucceſſive production.

But while we ſearch after, and bring up this "hidden treaſure," let us not be too ſanguine. Let us be careful not to bring up in mixture with it, what would not fail to thwart our beſt intentions,—cankering gravel, irony till, or corroding ſand.

What next comes in point, and is eminently uſeful, whether for improving this *new acquiſition*, or refreſhing, and in a great meaſure reſtoring, the *exhauſted* ſoil, is the diſcreet application of manure. There are many kinds of this moſt uſeful ingredient. The judicious will always apply *that* which is moſt evidently calculated to enrich and divide the ſoil, if over tenacious, or which will add adheſion to, and alſo enrich it, if too light and porous.

Next follows, ſkilful, and moderate *cropping*. In reſpect of the former, practice and experience *alone* can enſure ſucceſs, and the attainment of perfection. In reſpect of the latter, whoever ſhall bear in mind, that it is as neceſſary for land to reſt from *producing*, as for man to reſt from labour, and that it is of as bad conſequence to overburthen land with crops at any time as man with labour, will not fail to tread the right path. Farther, it is certainly preferable to have an article *good* in quality, than twice the quantity which is, perhaps, neither nutritive nor wholeſome. The judicious will proportion the *weight* of *crop* to the ſtrength and ability of the ſoil.

And this leads to another conſideration, namely, that of *weeds*. Of all things in nature, where art hath connection, the moſt diſguſting is that of a garden of weeds,—a thing inconſiſtent in itſelf, and alſo with common ſenſe. Do we ſow or plant with the intention of reaping? Do we wiſh to raiſe wholeſome and well-ripened crops? Do we look for re-imburſement and compenſation for expence and labour? And do we, at the ſame time, negligently ſuffer weeds to impoveriſh the ſoil, and rob the crop of the nouriſhment neceſſary to ſuſtain and bring it to perfection, and conſequently produce the deſired return?——Let us beſtow the attention this ſubject would ſeem to deſerve, and we ſhall conclude, finally, that ſucceſsful cultivation and production of vegetable food, in a great meaſure, depends on the following deſiderata:

A juſt knowledge of the quality of the ſoil; effectual draining; effectual plowing; effectual digging; effectual trenching; diſcreet manuring; moderate cropping; careful weeding; induſtrious reaping; and judicious fallowing.

CHAPTER I.

ON THE PROPER DEPTH AND SITUATION OF GARDEN LAND.

THAT kitchen vegetables do beſt on what is termed *new land*, is a generally-received opinion, and plainly demonſtrated in many inſtances. It is alſo a common complaint among gardeners, that their ground, from what is termed *worn out*, will not produce certain kinds of vegetables: not that it is poor and hungry, or altogether unadapted to the production of them, having perhaps formerly produced the very articles in great abundance; but that the ſurface has been many years under theſe crops, and that they have not a ſufficient quantity of ground for a proper change. In *walled* gardens this complaint is moſt general; and it would appear to be occaſioned by the expence of incloſing a ſufficiency of ground to ſerve the family, or of compoſing a body of ſoil of a competent depth.

That many kinds of kitchen vegetables do as well (if not better) in an open field-garden, as in one that is incloſed with high walls, and ſheltered, and perhaps ſhaded, with trees, is an undeniable fact: and, were it not for the production of the finer fruits, there would be little uſe in rearing garden-walls at all. But the ground thus incloſed is certainly occupied with more propriety in the production of vegetables than of any other crop.

And, as it is preſumed, the ground thus incloſed is to be occupied as a garden many years; that the walls have been built at a conſiderable expence; that the ground is trenched, walks made and laid out at a conſiderable expence alſo; and that, above all, it is deſirable to have a ſupply of wholeſome vegetables for the uſe of the kitchen, while the ground is thus occupied;—I ſhall drop a few hints on the method of obtaining this end, and which I have partly practiſed * with ſucceſs.

Firſt,

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* I ſay partly practiſed, becauſe the operation of it requires many years, and it has happened, (by my change of ſituation), to be out of my power to follow it fully

Firſt, then, it is neceſſary to have a depth of ſoil from twenty-four to thirty-ſix inches; which, in many inſtances, is not attainable without much expence and labour: but which, however, if the above object is kept in view, ought to be a ſecondary conſideration, as it requires but once doing; and the matter of from ten to twenty per cent. on the expence of the garden, will, in moſt caſes, be ſufficient for its accompliſhment. In this caſe, it is obvious, that whatever the depth of the natural ſoil lacks of twenty-four inches, is to be ſupplied by *forçing*, that is, carrying in ſoil from the adjacent fields: for it is not adviſable to trench up and mix *much* of the ſub-ſoil (of whatever texture it be) with it. Indeed, in many caſes, gardens are almoſt ruined by the injudicious admixture of the ſub-ſoil with the ſurface mould.

Secondly, Situation is to be conſidered. In page 245, I have already dropped ſome hints

fully out in practice. But I hope the theory will be found to be reaſonable, and conſiſtent with both horticular and agricultural improvement; and that it will be followed out by ſome of the many ingenious improvers of land wherewith the country abounds.

hints on this head; and would here further obſerve, that in few inſtances is it adviſable to lay down a garden on a level ſpot, ſuch ſeldom having a dry bottom, and being drained with more difficulty, if requiſite, than when there is a declivity. A north aſpect is alſo to be avoided, and preference ſhould be given to a ſouth, ſouth-eaſt, or ſouth-weſt: but even an eaſt or weſt aſpect, in many caſes, may prove excellent ſituations. A declivity of from a foot in twelve to a foot in thirty or forty will generally anſwer; but about one in twenty-five has the happieſt effect.

The rule I had laid down; and which I have partly practiſed, is this, viz. To take three crops off the firſt ſurface, then trench *three ſpit* deep, by which the bottom and top is reverſed, and the middle remains in the middle; take three crops off this ſurface, and then trench *two ſpit*, by which the top becomes the middle, and the middle the top; and take alſo three crops off this ſurface, and then trench *three ſpit*, whereby that which was laſt the middle, and now top, becomes the bottom, and that which is now the bottom, and was the ſurface at firſt, now becomes ſurface again, after having reſted ſix years. Proceed in this manner alternately; the one time trenching two ſpit deep, and the other three: by which means the ſurface will always be changed, and will reſt ſix years and produce three.

Hence will there always be *new ſoil** in the garden for the production of wholeſome vegetables; and hence alſo will much leſs manure be required, than when the ſoil is ſhallow and the ſame ſurface conſtantly in crop.

I have ſaid above, that the ſoil ſhould be from twenty-four to thirty-ſix inches deep: and I would not adviſe that it be much more, or at leaſt that it be trenched to a greater depth; as thereby the ſurface might be buried too deep from the action of the weather and influence of the ſun, and conſequently would be crude and unmeliorated for ſome time after trenching up.

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* I preſume the appellation is conſiſtent with the idea we have of New Soil, as certainly in reality there is no ſuch thing; but, by this proceſs, it will be in a great meaſure renovated.

In ſituations where the ſoil is only ſo deep as to allow of trenching two ſpit, and expence in making it deeper is grudged, the above hint may alſo be followed with advantage: as by regularly trenching every third or fourth year, the ground will reſt half its time; and, if judiciouſly managed, and cropped in proper rotation, wholeſome vegetables may be produced on it for many years ſucceſſively.

In many inſtances, it may be inconvenient, nay improper, to trench the *whole* garden over in the ſame ſeaſon; nor do I wiſh to advance ſuch a propoſition: one half, or a third, at a time, may be more adviſable, and alſo more convenient; of which, circumſtances *alone* can determine. But I would here obſerve, that, in caſes where the bottom is wet or tilly, in trenching at any time, care ſhould be taken to go exactly the ſame depth with each trench; a matter of evident benefit; for, if the bottom be left rough and uneven, and if *galls* are left between each trench, water will ſtagnate in the ſoil, and, of conſequence, by *ſouring* it, injure the crop, whether of trees or vegetables.

CHAPTER II.

ON THE NATURE AND VARIETY OF GARDEN LAND; WITH THE MEANS OF IMPROVEMENT.

IT is a happy circumſtance, that in many inſtances we meet with different ſoils in the ſame acre. In the ſame garden they ſhould never be wanting; and where nature (or natural cauſes) hath been deficient, recourſe muſt be had to art; inaſmuch as the variety of fruits and vegetables to be cultivated, require a variety of ſoils to produce them in perfection.

It would be abſurd, however, to imagine, that for every particular vegetable there is to be a particular ſoil prepared. The variety of ſoil in any garden may with propriety be confined to the following:—Strong clayey loam; light ſandy loam; (which are the two grand objects): a compoſition of one-fourth ſtrong, with three-fourths light loam; half ſtrong, and half light; and one-fourth light, and three-fourths ſtrong. Which, by a proper treatment, and with the proper application of manures, may be rendered productive of any of the known and commonly cultivated vegetables, in the higheſt degree of perfection.

But, in order to improve a ſoil, we muſt be guided much by its nature, ſo as, if poſſible, to render it ſerviceable in a general intention. And hence, our duty is, to endeavour to hit on that happy medium which ſuits the generality of eſculents, in the formation or improvement of the ſoil in the kitchen-garden. Such a ſoil ſhould be ſufficiently tenacious to adhere to the roots of plants, though not ſo much ſo as to be binding, which would certainly retard their progreſs and extenſion in queſt of food. Hence, a loam of a middle texture, rather inclining to ſand, may be denominated the moſt happy ſoil for the purpoſe here in view; and that on a double account, viz. The greater part of the valuable kinds of kitchen vegetables delight in ſuch, and it is worked at leſs expence than a ſtiff ſoil; neither in ſevere droughts is it ſo apt to crack or be parched; nor in hard froſts is it ſo apt to throw or ſpew tender plants or ſeeds out.

If ſoils be too ſtrong, the tender roots of plants puſh weakly in them, ſicken, canker, and periſh; and if a ſoil be too light, and if it be poor withal, plants depoſited in it will puſh their roots far, and in vain, in queſt of that ſtability and nutriment which is neceſſary and eſſential to their ſupport. So that, if the butt of our aim be perfection in the production of wholeſome and well-matured vegetables, we muſt put aſide careleſs indifference in the formation of a proper ſoil; nor truſt entirely to the force of dungs, were they even to be had in the greateſt plenty; for theſe, by *too free* an application, have an effect on the quality of eſculents, not altogether ſalutary.

Wherefore, that our efforts may be attended with ſucceſs throughout, let us beſtow a moderate and prudent expence in the firſt outſet, on compoſing or ſo improving the ſoil to be appropriated to this purpoſe, as that, in our beſt judgment, it may fully anſwer the intention. For,

Forming and compoſing the ſoil of a garden, is certainly more eaſily accompliſhed before, or at the time the walls are building, than afterwards: and we often find, where that matter has not been properly attended to at firſt, and where even the expence of doing it afterwards would be chearfully beſtowed, the principal obſtacle is the cutting-up of the lawns, ſhrubbry, walks, &c. Theſe conſiderations, however, ought to give way to the more ſolid advantages to be derived from the improvement of the kitchen-garden; the more eſpecially, as in the courſe of a ſeaſon, and at a trifling expence, they may be replaced in all reſpects as they were before.

In many caſes might the ſoil of the garden be improved in a very conſiderable degree at a ſmall expence. Thus, where the bottom is wet, and the ſub-ſoil of a cankering nature,—by judicious draining, which is certainly one of the greateſt improvements in this caſe: where the ſoil is ſtubborn,—by the addition of ſmall gravel, ſea ſand, wherein is a conſiderable quantity of ſmall pebbles and ſhells, coal aſhes, lime-gravel, pounded brick-bats *, brick-kiln aſhes, &c. &c. and, above all, by being carefully laid up in ridges in the Winter months, and indeed at all times when not in crop, in ſuch a manner as to give the greateſt extent of ſurface for the weather to act upon: where the ſoil is a poor ſand or gravel, &c.—by the addition of clay, or ſtrong clayey loam, ſcourings of ditches which run through a clayey ſub-ſoil, pond-mud in a like ſituation, or ſcrapings of roads, which lie in a clayey diſtrict, &c.

Soils that abound with metallic ſubſtances, and which generally make them appear of an iron colour, are termed foxbent or till. Theſe ſubſtances are often found to be intimately mixed, or rather conſolidated with the ſoil, in conſiderable maſſes, which are adheſive and very ponderous. Such ſoils are the moſt unfavourable to vegetation of any; and are quite ineligible for

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* I have witneſſed the effects of pounded brick-bats and brick-kiln aſhes in mixture, which were applied freely, in fertilizing a cold, wet, back-lying, clayey field, in an aſtoniſhing manner, by a ſingle dreſſing. This is a proof that clay, after being burnt, is completely changed in nature and effect.

for the purpoſe here in view, without being much improved. For this purpoſe, lime will be found the moſt ſerviceable of all things, if judiciouſly applied, and the ſoil be frequently turned over by digging or trenching; ſo as that the ſoil and the lime may be intimately mixed together, and that the atmoſphere may have full effect upon them: for without this, the lime will not operate ſo effectually, nor will the tilly particles of the ſoil be divided or meliorated ſo well.

It may ſeem unneceſſary to obſerve, that according to the quantity of irony matter contained in the ſoil, lime will be required to reduce it. In order to aſcertain this quantity, a magnet will be found uſeful; and, by one of the maſſes being calcined, and then reduced to a powder, will ſeparate the irony particles from the ſoil or reſiduum; ſhowing the proportion of iron, and of earth. Thus we may judge, what quantity of lime will be required to fertilize the ſoil; taking for the extremes in ordinary caſes, and ſuppoſing the lime of a middling quality, 150 and 400 Wincheſter buſhels an acre; applying the lime in a quick or powdered ſtate, and properly working the ſoil; being careful, in the firſt place, to drain it of ſuperabundant moiſture.

Ridging-up of land, as above hinted, has the happieſt effect, eſpecially for ſtiff ſoils, and ſhould never be omitted when the ground is not under crop. In dead ſandy loams, alſo, and in cankering gravels, it is of infinite advantage for meliorating them: but in very light ſandy ſoils, it is not adviſable to carry this practice to too great an exceſs. For it is a fact proved by experience, that, by expoſing ſoil to the ſun's rays in part, by throwing it into a heap, whereby it is alſo partly ſhaded, and trenching it once a month, will ſooner reſtore it to fertility than any other proceſs, excluſively of adding freſh matter.

And thus, if any ingredient, noxious to vegetation, abound in the ſoil, it may be expelled, or exhaled, by the action of the atmoſphere; more particularly if the ſoil undergo a Summer, and alſo a Winter fallow. In the latter caſe, however, care ſhould be taken to have the ſurface incruſted by froſt as often as poſſible, by turning it, and giving it a new ſurface each ſucceeding thaw.

CHAP.

CHAPTER III.

ON MANURES, AND THEIR APPLICATION.

THOSE moſt to be preferred for the uſe of the kitchen-garden are—ſtable-dung, cow-dung, hog-dung, ſheep-dung, pigeon-dung, ſoot, lime, loamy marl, ſhell-marl, ſea-weed, wood-aſhes, whin-aſhes *, fern-aſhes, coal-aſhes, vegetable mould of decayed tree-leaves; and vegetable mould of decayed vegetables of all kinds, as cabbage leaves, haulm, weeds, &c. to which may be added with much propriety, although a fluid ſubſtance, the richeſt of all, and that in which is moſt of the food of vegetables, viz. the drainings of the dunghill.

Manures

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* I have witneſſed the aſtoniſhing effects of whin-aſhes *alone*, in producing herbage in a five or ſix fold degree; which was the more obvious, on account that the field on which they were applied was much alike in quality, (a ſtiff, wet, clayey loam), and the aſhes were applied partially. The effect was viſible for ſeveral ſucceſſive years, Alſo, on the timber-trees, with which the field was afterwards planted.

Manures are to be applied either as ſimples or compounds; but the latter method is certainly the moſt eligible. For certain it is, that if they have not undergone a proper fermentation, their effects are, giving a rank and diſagreeable flavour to fruits and vegetables; and if an immoderate quantity is applied, of producing a conſiderable degree of unwholeſomeneſs, and tainting the juices of all plants.

A combination of ſtable-dung, ſea-weed, lime, and vegetable mould, which has lain in a heap for three or four months, and has been two or three times turned during that period, will make an excellent manure for moſt kinds of garden-land. Alſo, cow-dung, hog-dung and ſheep-dung, mixed with ſoot or any of the kinds of aſhes. Pigeon-dung, marl, and vegetable mould, well mixed, will alſo make an excellent manure for heavy land; or even for lighter ſoils, provided the pigeon-dung be uſed ſparingly.

Neats-dung, that is, of cows and oxen, and hog-dung, being ſlightly fermented, will compoſe a very fit and rich manure for light, hot ſoils. For thoſe of a dry, abſorbent nature, perhaps none would anſwer better, or laſt longer, by reaſon that they retain moiſture for a greater length of time, and alſo ferment more ſlowly, than other dungs.

Pigeon-dung, lime, ſoot, aſhes, &c. ſhould never be applied as ſimples; the quantity of them required being comparatively ſmall, and the regular diſtribution difficult, without the admixture of other matter. But theſe ſhould generally be applied in compoſt, of good earth, turf, or ſward, or of cow or other dung of a cool nature: applying them in quantity according to the cold, or the hot nature, of the ſoil to be manured; allowing the compoſt a ſufficient time to incorporate, and mixing it thoroughly.

Marl is an excellent manure for almoſt any ſoil; and may be applied as a ſimple with as much propriety as any of the kinds of cattle-dung, or even vegetable earth. The kind called ſhell-marl is much to be preferred; and ſhould be freely applied to ſtrong lands, but more ſparingly to light: the loamy kind being beſt adapted to light lands.

Stable-dung, if uſed as a ſimple, ſhould not be applied in too-rank a ſtate, nor ſhould it be too much fermented. It ſhould generally lie in a heap for two or three weeks; during which time it ſhould be turned once or twice. A ton of it in this ſtate, is worth three that has been uſed in the hot-bed, and is a year old. This manure, and indeed dung of any kind, when applied as ſimples, ſhould never be carried from the heap to the ground, till it is to be digged in; as, by its expoſure to the air, the virtues evaporate, and it is the leſs effectual.

The neceſſity of the inſtant application of ſea-weed after landing, if uſed as a ſimple, is even greater than the above; as it inſtantly corrupts, and its juices flow downwards, and are loſt. If this manure is uſed as a compound, the heap wherein it is compounded ſhould be more frequently turned on its account; that none of the juices may be loſt, but that the other part of the compoſt may abſorb them.

Horſe-dung, and the dung of ſheep, deer, rabbits, &c. are moſt eligible for cold, wet ſoils; and all theſe, or any of theſe in compoſt with lime, will be found beneficial. For ſuch ſoils alſo, a compoſt of coal-aſhes, pigeon-dung, and lime; or of wood-aſhes, whin aſhes, fern-aſhes, and ſtable-dung; or, of deer-dung, rabbits-dung, ſoot, and burnt ſward, &c. will make a good manure.

Manures being valuable in proportion to the ſalts and the oils they contain, are to be applied in quantity according to their quality. Hence, the dung of pigeons ſhould be uſed in much ſmaller proportion than that of horſes, it containing a greater quantity of volatile ſalts; and ſo the aſhes of vegetables containing a portion of fixed alkaline ſalts, being more powerful, are to be applied in ſtill ſmaller quantity. So alſo, lime, being the moſt powerful of the calcareous kinds, ſhould be applied, in ordinary caſes, in much ſmaller quantity than marl.

Vegetable mould may either be uſed as a ſimple or a compound, and is to be applied with equal propriety to all ſoils. None can be hurt by it in any degree; ſince almoſt every plant will grow luxuriantly in it entirely, without the aid of any ſoil or manure whatever. It ſeems to be the ambroſia, and the dunghill drainings, the nectar, of vegetable life. The latter, however, if too freely indulged in, is rather of an intoxicating nature.

The importance and effect * of manure being now generally credited and acknowledged, (at leaſt much more ſo lately than heretofore); it would appear to be the indiſpenſable duty of every gardener and cultivator of the earth, to be careful in the collection of it, and alſo to diſtribute it with ſkilful frugality. For this purpoſe, a well, ciſtern, &c. ſhould be contrived ſo as to collect the dunghill drainings; and in the application of manure of any kind, the greateſt care ſhould be taken to divide it equally, according to the quantity to be applied.

All animal ſubſtances, when properly applied, are good manures; and as animals

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* We may briefly define the effect of manures, when *properly* applied, thus: Correcting tenacity, crudity, and poroſity in the ſoil; exciting its fermentation, communicating nutritive matter, and affording nouriſhment to the roots of plants; thereby promoting vegetation, and their perfection.

derive their ſuſtinence, either immediately, or ultimately, from vegetables, theſe, when properly decompoſed, become great promoters of vegetation. Hence, dungs in general are ſuperior to other manures; and are the more valuable in their kinds, according to the proportion of oils they contain, which are moſt eaſily reducible, by the nitrous acid of the air, into that ſpecies of mucilage, allowed to be the eſſential pabulum or nutriment of plants. Our duty, therefore, is to collect theſe with care, and apply them with attention.

The dunghill may alſo be conſiderably increaſed by throwing the haulm, ſtalks, and leaves of all vegetables into a common heap, letting them remain till well rotted, and afterwards mixing them with lime, marl, aſhes, ſoot, &c. or in the proceſs of collection. Watering the whole frequently with the drainings of the dunghill, would greatly enhance its value. Like a good *roaſt*, it ſhould be well *baſted* with its own drippings *.

CHAP-

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* An obſervation that lately excited a hearty laugh from an epicure.

CHAPTER IV.

CULTURE OF KITCHEN VEGETABLES.

SECTION I.

ARTICHOKES.

THIS plant will grow freely in light loam of any kind, provided it be well enriched with compoſt, ſtable-dung, marl, or ſea-weed. It requires a depth of ſoil from twenty-four to thirty inches, to produce it in perfection. In ſtiff wet lands, artichokes frequently periſh in winter.

It is propagated with facility by offsets from the old ſtools, which are produced every ſpring in great abundance, and are to be planted in patches of two or three plants each, at the diſtance of four feet, patch from patch each way, watered frequently in dry weather, the firſt ſummer, and kept clean of weeds.

As this plant is very tender, and eaſily killed by froſt, the rows, &c. ſhould be

carefully

carefully covered with ſtable-dung, or other litter, in the early part of winter, which is preferable to the method of digging out trenches, and moulding up with the earth dug therefrom, as, by that mode, the roots are doubly expoſed. In a thouſand inſtances were the whole ſtock of Artichokes killed, by the early ſetting in of the froſt in 1796, which laſted but three weeks, and was far from what may be termed ſevere. And many of theſe were landed up; but none that were *well covered* ſuffered.

In proceeding to cover up the plants with litter, &c. let the decayed ſtalks, and alſo the ſtrong outſide leaves be removed; then lay the litter in a ridge all along on the rows, of breadth ſufficient to cover the extremities of the roots, and to the thickneſs of about ten or twelve inches.

In ſpring, *i. e.* about the firſt or middle of March, the littery part of the covering is to be removed, and the ſmall, or rotten part ſhould be digged in, previouſly reducing the number of plants on each ſtool to three or four of the ſtrongeſt; as otherwiſe they would grow too thick, and the heads, in conſequence, would be rendered ſmall.

One hoeing will generally be ſufficient for the ſeaſon, as hardly any weed will grow under their foliage, and theſe will ſoon cover the whole ground.

The above culture is to be repeated every ſeaſon, for the old ſtools; and where a ſucceſſion of Artichokes are in requeſt, a few young ones ſhould be planted every year. They will produce in autumn, in ſucceſſion to the old ones, and laſt till the froſt deſtroys them.

Old ſtools ſhould not be ſuffered to remain above ſeven or eight years in the ſame ſpot, otherwiſe they produce diminutively.

SECTION II.

ASPARAGUS.

THIS vegetable is moſt ſucceſsfully produced on a light ſandy loam of at leaſt two feet in depth. And the beſt manures, in this caſe, are—a compoſt of ſtable or cow dung, hogs-dung, ſea-weed, marl, and vegetable earth; or ſtable-dung and vegetable earth; or, ſea-weed and any of the above.

Strong loam does not anſwer well for Aſparagus; but it may be much improved by the addition of gravely loam, light ſandy loam, ſea gravel, brick-bats pounded and mixed with the kiln-aſhes, &c. In this caſe, the beſt manures are—a compoſt of vegetable earth, ſoot, pigeon-dung, and any of the kinds of aſhes; or, ſtable-dung, ſea-weed, and ſhell-marl; or, ſheep-dung, ſea-weed, and marl; or, ſea-weed, ſtable-dung, or ſhell-marl, as ſimples.

As Aſparagus does not come to maturity for ſeveral years; and as there is no poſſibility of *effectually* manuring it after ſowing or planting, without hurting its roots, which are very brittle, the greateſt care is neceſſary in preparing the ground for its reception, which ſhould be trenched at leaſt two feet deep, and the manure well mixed with the ſoil in the operation.

It is common to raiſe Aſparagus on a ſeed-bed; and tranſplant it into beds four feet wide, with alleys of two feet between them. In ſome inſtances, the beds are only two feet, and contain but two rows, with alleys alſo of two feet. This method is preferable to the former. But the moſt approved, is, to drill in the ſeed where it is to remain, in ſingle rows, a yard apart and an inch deep; ſowing pretty thick, in order to inſure a crop *: even four feet apart for the rows would not be too much.

I have ſeen an inſtance where a piece of ground was equally trenched and manured; the one-half of it was drilled at one yard, and the other at two apart; that which ſtood at two yards, as I was aſſured by the proprietor, produced a greater quantity of graſs on the ſame quantity of ground than the other, and the buds were much larger.

That Aſparagus, which is ſown where it is to remain, will be ſtronger, againſt the third year, than that which is tranſplanted, I have myſelf proved in more than one inſtance; and would therefore adviſe this practice in preference to the other.

If the ſpring proves dry after ſowing, the rows ſhould be frequently refreſhed

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* The middle of March or firſt of April, is the proper ſeaſon for ſowing.

with water. When the plants have arrived at the height of three inches, thin out the rows to about five or ſix apart, and draw a little mould to the ſtems of thoſe left. Keep clean of weeds for the remainder of the ſeaſon, and indeed at all times; frequently ſtirring the ſurface, which will greatly promote the growth of the plants.

The beſt manures, and moſt proper application, for the rows or beds of Aſparagus, is—the drainings of the dunghill, which may be applied at any time; ſea-weed, which may be applied at any time from October to March, and ſhould be ſpread on the ſurface as it is carried from the ſhore; a compoſt of lime and dung, or dung and marl; and ſtable-dung alone, which ſhould he ſpread on the ſurface about October or November, and let remain till the firſt of March.

This laſt is the common method of manuring Aſparagus land: but there are many who do ſo merely becauſe they ſee others do it; and who imagine it to be done in order to preſerve the plants from the effects of froſt, and of conſequence they choose the moſt littery part of the dung for this purpoſe. This idea is erroneous; and I have ſufficiently proved that Aſparagus roots will in nowiſe be injured by the ſevereſt froſt. Plants of the firſt year, however, may with propriety be covered, to prevent their being ſpewed out of the ground; but, otherwiſe, it is not neceſſary to their preſervation. In the very ſevere Winter of 1794-5, there was no covering of any kind on my Aſparagus, nor was it even what is termed *landed up*.

Inſtead of *landing-up* in Autumn, having previouſly cut the haulm down to the ground, clear the ſurface of weeds, &c. and ſtir it up to the depth of two or three inches with the fork; that it may the more freely receive, not only the juices of any manure that is applied, but be more readily acted upon by the weather. In Spring, if it has been covered with ſtable-dung or ſea-weed, gather off the rough part of it, and ſlightly point in the ſmall; at the ſame time ſhedding a little mould on the rows, being careful not to go too near the roots of the plants, as theſe, if poſſible, ſhould never be diſturbed. This operation is to be performed

formed about the firſt or ſecond week in March.

It is a common practice to plant or ſow other crops on the beds, or between the rows of Aſparagus. This may be proper for the firſt year or two, if done in moderation, introducing a row of cauliflower. Turnips, &c. in the middle of each interval of the rows, or in the alleys between the beds. But after this, it becomes altogether improper, as by the time the roots begin to ſpread, in either mode of ſowing or planting, they ought; on no account, to be diſturbed; more particularly if it be wiſhed to rear large, handſome graſs.

Aſparagus *beds* ſhould not lie above eight or ten years; but where it is cultivated in *rows*, it may lie conſiderably longer. However, where the forcing of the roots is practiſed, it is ſeldom ſuffered to lie even that time; as plants of from four to eight years old are fitteſt for this purpoſe.

In reſpect of cutting, the third year ſhould arrive at any rate, even if the graſs is ſufficiently ſtrong the ſecond, (which, however, is ſeldom the caſe): becauſe, by being cut too ſoon, it weakens the roots much; and the encouragement of theſe, till the graſs is perfectly eſtabliſhed, is a principal object.

We often ſee blanks in Aſparagus beds, &c. that are producing, which were not originally in them, or before the graſs was begun to be cut. This is occaſioned by injudicious cutting; and not, as is generally ſuppoſed, by accidental natural cauſes: and what occaſions it is evidently, that, in cutting, *all the ſtalks* of ſome of the plants are cut; which, although they may put forth the next Spring, (but this they will in ſome inſtances do in Autumn. See note, page 11.), do ſo in a very weak manner, and periſh in the following Winter. Wherefore, care ſhould be taken to leave at leaſt one or two buds to each plant in order to draw nouriſhment to, and encourage the growth of the roots.

In cutting, be careful not to injure the young buds riſing about thoſe fit to be cut, nor to wound the crown of the root. The roots of few plants take worſe with *wounding* than thoſe of Aſparagus, which, from their ſucculent nature, bleed more or leſs at every bruiſe.

SECTION III.

BEANS

DO beſt in ſtrong land; but are ſucceſsfully produced on almoſt any kind of garden ground. In gardening, the land is ſeldom manured for a Bean crop, as they generally follow that of cabbage, cauliflower, &c. which are commonly planted on well-prepared ground.

Beans may be tranſplanted with ſucceſs, and where they are required at a very early ſeaſon, the following method ſhould be practiſed:

Sow, of the early Mazagan, in large pots or boxes, being filled with rich mould, about the firſt of November; place them in the green-houſe, peach-houſe, &c. or under a frame and lights, and ſo, as that the plants may enjoy the free air and light, and grow ſlowly; when they come up, refreſh moderately with water; keep them here, or in a like ſituation, till the firſt of March; and then plant them out under a wall having a ſouth aſpect, or other well-ſheltered warm ſpot, enjoying the full ſun, all along in a row at two inches apart; taking them carefully out of the pots or boxes, with their fibres entire.

For a ſecond crop, ſow of the Mazagan or Liſbon kinds, on an early border, in a ſouth aſpect, in rows twenty inches apart, about the firſt of January. And for ſucceſſional crops, ſow or plant in an open expoſure, of the Long-pod, Windſor, Sandwich, Toker, &c. in rows from twenty-four to thirty inches apart, from the firſt of February to the firſt of June, at intervals of about three weeks.

The crops are invariably to be kept clean of weeds, and earthed up at two different times, viz. firſt, when the plants are about two inches high, and, laſtly, when they are about ten or twelve.

Topping the early crops, about the time the pods are diſtinguiſhable on the lower part of the ſtalks, is of advantage; the pods will ſwell conſiderably ſooner in conſequence.

SECTION IV.

BEET.

OF this plant, there are two kinds in cultivation for the uſe of the kitchen, viz. the Red, for its roots, and the Green, for its leaves, which are uſed in manner of ſpinage. The former, however, being moſt in demand, I will chiefly confine my obſervations to it.

The ſoil which ſuits this plant beſt, is a light dry loam, of at leaſt eighteen inches in depth. On ſtiff, ſhallow ſoils, the roots canker and get forked. In all caſes, the ground ſhould be deeply digged or ſubtrenched, and ſhould be well broke in the preparation. It is better not to apply manure at the time of cropping with *beet*, but the land ſhould be in good heart.

The ſeaſon for ſowing is from the middle of March to the firſt of May; taking, for the fitteſt time, the firſt week in April.

After digging, &c. roll the ground lightly, or tread it ſmoothly with the foot; then draw drills an inch deep, and twelve or fourteen inches apart, according to the quality of the ſoil; ſow the ſeeds thinly; cover them in, and ſmooth all with the rake.

When the plants have arrived at an inch or two in height, thin them out to five or ſix apart in the row; and keep them clean of weeds at all times. Beet may be preſerved in Winter, by being ſtored in the manner of carrot. See Section IX. of this Chapter.

The Green ſort may be raiſed much in the manner as above; but as the *tops only* are uſeful in the kitchen, it is not neceſſary to take equal pains in preparing the ground. It is much like ſpinage in its manner of growing, and is generally uſed in the ſame intention. In gathering the leaves, care ſhould be taken not to injure the crown of the root, as in that caſe, it would bleed much.

SECTION V.

BROCOLI

DELIGHTS in a ſtrong loam, but will do well in any common garden land, if well enriched with ſtable or cow dung. Where a ſucceſſion of it is required, a little ſhould be ſown on an open light ſpot about the middle of March or firſt of April, and planted out about the firſt or middle of May, on an open rich ſpot, in rows two feet apart, and eighteen or twenty inches in the row. The principal crop is to be ſown about the firſt or middle of May, and planted out in July; and a later crop may be ſown in the end of June, and planted out in Auguſt: Strong loam in an open ſituation is the moſt eligible ſoil.

All the crops ſhould be ſown *thinly* in free ſoil and an open ſituation. If otherwiſe, they will require to be pricked out into nurſery beds, in order to ſtrengthen them, and that they may be furniſhed with good roots.

The brown, green, or purple kinds, anſwer beſt for early crops, and the white, for the principal and late.

Keep them clean of weeds, and when the plants are fairly eſtabliſhed and begin to grow, let a little earth be drawn up to their ſtems, which will greatly promote their growth. Before the leaves expand ſo as to cover the ground, let them be finally moulded up; and this is to be obſerved alſo for cauliflower, cabbage, ſavoys, &c.

In fine ſeaſons, it will ſometimes happen, that the early crops of brocoli get too forward, and are unfit to ſtand the Winter froſts. When this appears to be the caſe, in the end of October or firſt of November the plants ſhould either be lifted entirely and *ſoughed in* on another ſpot, or they ſhould be *heeled* and laid over in a ſloping poſition where they ſtand. Being thus checked, and their hearts guarded from the weather, they will better endure the ſeverity of Winter.

SECTION VI.

BRUSSELS SPROUTS.

THIS is a good vegetable for Winter and Spring uſe, and is much admired by many. The ſprouts which iſſue from the ſtem are the eatable part, and are fine delicate greens; good ſubſtitutes for brocoli.

The ſoil, ſituation, and the culture that anſwers for brocoli, will alſo anſwer for this plant in all reſpects.

SECTION VII.

CABBAGE.

CABBAGE is plentifully produced on garden land of almoſt any kind; but moſt abundantly on a ſtrong loam of eighteen to twenty-four inches in depth.

The land ſhould always be manured for this crop, as one of the leguminous kinds ſhould follow it. If it is a light ſand, &c. cow dung, hog dung, or loamy marl, is moſt eligible; if a ſtrong loam, ſtable dung, ſea weed, or ſhell marl, as ſimples; or a compound of all theſe, or of any of theſe with ſheep dung, pigeon dung, vegetable mould, or of any of the kinds of aſhes; if a clay, ſtable dung, ſea weed, ſhell marl, or ſheep dung as ſimples, or a compound of lime, ſtable dung, ſea weed, pigeon dung, and vegetable mould, or of ſhell marl, ſtable dung, ſea weed, any of the kinds of aſhes, and vegetable mould; or of any two or more of the above.

The ſame manures for the ſame ſoil, will equally anſwer for cauliflower, greens, ſavoys, &c.

There are many kinds of cabbage in cultivation; but thoſe moſt eſteemed for the garden are, the Early Dwarf; Early York; Early Sugarloaf; Late ditto; Batterſea; Red, for pickling; and the large broad Dutch for cattle.

For an early crop, ſow of the Dwarf, York, Early Sugarloaf, or Batterſea, (but the true Early York is to be preferred), on a light open ſpot about the firſt or ſecond week in Auguſt; and about the firſt of October plant them out on an early border, or other warm ſpot, at the diſtance of a foot each way, that in Spring the one row may be cut up for Greens, which are then in general requeſt, and the other may be retained to come to maturity; and for a ſucceſſional crop, plant of the ſame ſowing and kinds, and alſo on the ſame or a ſimilar ſituation, about the firſt or middle of February, at the diſtance of eighteen or twenty inches each way.

For crops to ſucceed theſe, ſow of any of the above kinds every three or four weeks from the firſt of February to the firſt of June, on an open ſpot of light land; and plant, when fit, in an open and free ſituation, at the diſtance of from eighteen to twenty-four inches each way, according to the kinds, and quality of the ſoil.

The Red kind is to be ſown in Auguſt or February; and ſhould be planted out in October or April, on an open ſpot at the diſtance of two feet each way.

The broad Dutch is to be ſown about the firſt of September, and planted out in

March; or in the beginning of February, and planted out in April; on a well-expoſed ſpot, at the diſtance of thirty inches each way.

The two laſt kinds, being generally left in the ground for Winter and Spring uſe, and from the length of their ſtalks, are frequently much injured by the ſeverity of froſt, ſhould be laid over in an oblique direction, which both ſecures them from froſt, and from the bad effects of blanching rains, in rotting their hearts.

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SECTION VIII.

CAULIFLOWER.

THIS vegetable being much eſteemed, there are few who are not provided with hand or bell glaſſes for its early production. For this crop, the plants ſhould be ſown on a light open ſpot, about the latter end of July, or firſt of Auguſt; and when they are fit for pricking out, ſhould be put ſingly into pots of four inches diameter, filled with rich mould, and placed which methods care ſhould be taken to keep them as dry as poſſible, and to diveſt them of any leaves which decay.

The ſoil that produces this vegetable beſt, is a loam neither light nor ſtiff, of at leaſt eighteen inches in depth, and which is well enriched with any of the common manures uſually applied to ſuch ſoils. Of this, ſee the article Cabbage.

SECTION IX.

CARROT.

THIS, above all other vegetables, delights in *new land*, and that which produces it beſt is a light, ſandy loam, of eighteen or twenty inches in depth at leaſt. Carrots ſhould never be ſown with manure of any kind at the time of ſowing; being produced beſt and cleaneſt on land that has been manured for the preceding crop.

The beſt crop I ever ſaw, was growing on a ſpot of ground (a ſandy loam, and rather poor), which was trenched three ſpit deep, and which a ſpade or plough had never previouſly penetrated into, above nine inches.

For an early crop, ſow of the early horn, or orange kinds, on a ſlight hot-bed, about the middle of January; or on a light, early border under hand-glaſſes, &c. about the firſt of February. Let them be frequently refreſhed with water, expoſed to the air in freſh weather, and kept clean of weeds; alſo thin them out to about three inches ſquare.

The principal crop ſhould be ſown about the firſt or middle of April, in an open expoſure, in drills an inch deep, and at the diſtance of twelve or fourteen apart. The long red, or orange kinds are fitteſt.

The chief property of this vegetable is the length and cleanneſs of the root; and for the attainment of perfection in this reſpect, the land ſhould be trenched or ſubtrenched to the depth of eighteen inches at leaſt, and well broke in the operation of trenching. Before drilling, the ſurface ſhould be lightly rolled, or evenly trodden with the foot, otherwiſe the ſeed is apt to be unequally buried.

depended on, the others frequently running to ſeed.

In all which caſes, light rich mould is to be choſen. I have found vegetable mould of decayed tree-leaves, of infinite advantage for the early crops.

The manner of planting, ſituation, and ſoil, for all the crops, ſhould be the ſame, and the following is moſt approved: The plants in all caſes are to be pricked out into nurſery beds, which ſtrengthens them much, and makes them put forth fine young fibres; and when they are fit for planting they are to be planted in rows, twenty inches aſunder, and eight inches in the row, acroſs trenches of eight feet wide, having ſpaces of four feet between them, whereon to lay the mould that is dug out of them, which is to be done to the depth of ſix inches only, this, together with the depth of the ſoil of ſaid ſpaces, being ſufficient for moulding up with. This is to be underſtood, however, of land that is at leaſt two feet deep, and which lies dry; as, on the contrary, the plants are to be planted on the ſurface, and the ſpaces between, are to be a foot or two more, to afford a ſufficiency of ſoil for blanching with.

The ſoil beſt adapted to the production of Celery, is a rich loam of a middling texture; and the fitteſt manure is a compoſition of ſtable dung, and vegetable earth; but ſtable dung alone, which is pretty well reduced, will do very well. Light ſandy loam well enriched with cow dung, will alſo produce Celery in abundance. Celery grows well, and arrives to a good ſize, in peat-earth.

In moulding up, a dry day is always to be choſen, and too much is never to be applied at a time, leſt the hearts of the plants be covered, in which caſe they are ſure to rot, if damp weather enſue. Celery may be ſucceſsfully preſerved for many months in ſand, &c. in the ſame manner as carrots. See the preceding ſection.

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SECTION XI.

CARDOONS

ARE in requeſt in many families. They are moſt ſucceſsfully produced on a deep ſandy loam, not too rich.

Prepare ſingle trenches, in manner as is practiſed by many for celery, at the diſtance of four or five feet from centre to centre, and juſt as deep and wide as a ſingle ſpit will make them, laying the mould in the interſpaces. Point in a little compoſt manure in the bottom; draw a drill an inch deep in the centre of the trench, and drop the ſeeds at two inches apart. The ſeaſon is, from the middle of May to the middle of June.

When the plants are two or three inches in height, thin them out to about nine or ten apart. Mould up in all reſpects as for celery, with this difference only, that the leaves muſt be gathered, and tied together each time with a bit of old matting, otherwiſe the mould would get between them in the proceſs of blanching.

Cardoons may alſo be preſerved in winter, in the ſame manner as carrots, celery, &c.

SECTION XII.

FRENCH BEANS

ARE moſt ſuccesfully produced in a rich, light, dry loam, and are moſt prolific without manure, at the time of ſowing or planting.

For an early crop, ſow in a hot-houſe, hot-bed, or under hand-glaſſes, of the Speckled Dwarf, about the firſt of April, and plant them out, when fit, at the bottom of a wall or other fence, having a ſouth aſpect. For a ſecond crop, ſow in drills two feet apart, of the Speckled Dwarf, Batterſea, Negro, Liver-colour, &c. on an early border, or other warm ſpot, about the middle of April or firſt of May; for a third crop, of the ſame kinds, on an open expoſure about the middle of June; and for a fourth and laſt, of the Scarlet or White Runners, on a like ſituation, in drills three feet apart, about the firſt or middle of July. Theſe muſt have ſticks to run on, and will generally produce till froſt deſtroys them.

Keep them clean of weeds, and let them be earthed up, firſt, when the plants are about three inches high, and finally, when about nine or ten.

SECTION XIII.

GARLICK

WILL grow freely on almoſt any kind of garden land. Plant the cloves in rows twelve inches apart, and ſix in line, any time from the firſt of March to the firſt of May.

It requires no other attention than being kept clean of weeds, and being lifted when the leaves begin to decay.

SECTION XIV.

GREENS,

THAT is, Savoys, Cale, or Kail, German Greens, &c., are cultivated in all reſpects much in manner of cabbage; and are generally planted in an open and well-expoſed ſituation. The times of ſowing are February, March, May, June and Auguſt; and of planting, March, May, July, Auguſt and September. But where a conſtant ſucceſſion is required, they may be planted every three or four weeks from February to September. The diſtance is from twelve to twenty-four inches each way, according to the ſtrength of the land, ſeaſon of the year, ſize and age they are ſuffered to grow to, &c.

SECTION XV.

HORSE-RADISH.

THIS is a wholeſome root, is much uſed, and in conſtant demand. It does beſt on a rich ſandy loam, but will grow freely enough in common garden earth of any kind, provided it be a foot in depth.

It is propagated moſt ſpeedily by parting the crowns of the roots into ſlips; but any part of the root, having an eye, will grow and become a plant. The ſeaſon is October, November, March, or April.

Plant in trenches ſix or eight inches deep, fifteen apart, and ſix inches aſunder in the trench; or in deep drills; or with the ſetting ſtick, according to the ſize of the roots or ſlips.

This plant requires no other culture than being kept clean of weeds; and where it is required in perfection, new plantations being made every three or four years.

SECTION XVI.

LEEKS.

THIS is a hardy vegetable, and does well on moſt kinds of garden land, but is produced in greateſt abundance on a ſtrong loam. The ground ſhould always be manured for this crop, eſpecially if for ſpring uſe, as, in that caſe, leeks exhauſt the ground much. It may be any of the kinds moſt properly applicable to the ſoil.

The ſeed is to be ſown on a bed of light, rich loam, at any time from the firſt of February to the firſt of April. The true Scotch (broad-leaved or flag) Leek is to be preferred. The ſeaſon of planting is, from the firſt of June to the firſt of Auguſt; and they are to be planted in rows twelve or fourteen inches aſunder, and five or ſix in the row. The moſt approved method is to make deep holes with the ſetting-ſtick, thruſt the plant to the bottom, and let the hole remain open. This is done with the view of ſaving time in drilling, as it is found the plants ſtrike root as faſt this way as if the earth were cloſed about them; and ſo afford an opportunity of blanching equally well.

A crop to come in, late in the Spring, may be ſown in May, and planted out in the end of Auguſt or firſt of September, according to the ſeaſon.

Keep clean of weeds; and *top* the leaves three or four different times in the courſe of the ſeaſon, which makes them put forth new heart leaves, and conſequently ſwell the ſtalk to a much greater ſize than they otherwiſe would.

SECTION XVII.

ONIONS.

THIS is a valuable vegetable, as moſt people are fond of it. It requires a ſtrong rich loam to produce it in perfection; but in wet ſeaſons, we frequently ſee good crops raiſed in light land.

In all caſes, the land ſhould be well enriched with manure, which, however, ſhould not be applied at the time of ſowing; the beſt method being either to fallow or take a light crop immediately before, when the manure ſhould be applied; which may be any of the kinds beſt adapted to the nature of the ſoil. If this is not the caſe, and if manure is to be applied at the time of ſowing, compoſt is to be preferred to ſimples.

A fixed ſeaſon for ſowing can hardly be determined, as in all caſes we frequently ſee the crop blaſted in Summer, either with too much wet or drought, in which latter caſe, it is ſure to be deſtroyed by maggots. Amongſt the beſt crops I ever ſaw, were ſown about the middle of January. The middle of February or firſt of March, however, ſeems to be a more eligible time, as the weather is then generally more favourable for ſowing ſmall ſeeds.

I have alſo both raiſed, and frequently ſeen, excellent crops of Onions that were ſown about the firſt of Auguſt; in which caſe, about the firſt of May following, when they begin to ſhoot, their hearts ſhould all be picked out to prevent them from running to ſeed. This, in fact, ſeems to be the ſureſt way of obtaining a crop on light land; but in wet land it is not adviſable.

Onions ſhould be ſown either on four-foot beds, or in drills a foot aſunder, and ſhould be thinned out to five or ſix inches ſquare in the one caſe, and three apart in the row in the other. The kind beſt adapted to this climate is the Straſburgh, for although the Portugal, &c. will grow freely enough, it ſeldom ripens well, and conſequently does not keep.

Onions may be ſucceſsfully tranſplanted; and when it happens that there are blanks in the beds or drills, this ſhould be practiſed, that there may be an equal crop on the ground.

In all caſes, let the ground be kept clear of weeds; and about three or four weeks before the crop is fit for pulling, let their ſtems be all broke down, or in other words, *laid*. This is moſt ſpeedily performed by two people taking each the end of a rod, and walking ſlowly up the alleys or rows, holding the rod at ſuch a diſtance from the ground as to generally ſtrike the plants at the height of four inches above the bulb. This is of great uſe, particularly in wet or late ſeaſons, as the growth is thus diverted from the leaves, and the bulb ſwells faſter in conſequence.

It is of importance that Onions be taken up and *houſed* in a comfortable, dry ſtate; therefore, when the crop approaches to maturity, advantage ſhould be taken of favourable weather, to have them pulled and prepared for ſtoring, by turning them over frequently, and ſpreading them thin in a dry, airy place. Being *ſtrung*, and hung up in a ſhed or loft that may be defended from froſt, is as good a mode of preſervation as any other.

Crops to pull green, for Winter and Spring uſe, ſhould be ſown, thickly, about the end of July or firſt of Auguſt. None of the kinds are ſo fit for this purpoſe as the Straſburgh. The Welſh Onion has been much uſed in this intention, but is now generally out of repute.

SECTION XVIII.

PARSNIP.

THE cultivation of this root is ſo nearly ſimilar to that of carrot, that it would only be waſting time in ſaying more of it, than that the ſeaſon of ſowing is from the firſt of March to the firſt of May; and that, as the leaves grow more groſs than thoſe of carrot, they are to be allowed an inch or two more between the plants in the row.

This root, however, although now much out of uſe in the kitchen, is of a very nouriſhing quality; and for cattle feeding, is known to be very profitable. As carrot is good food for horſes, ſo Parſnip is good food for kine; and it is a productive crop, even on indifferent ſoil.

SECTION XIX.

PEAS.

THESE are in general requeſt from the month of June till November, if the weather will permit. The moſt ſucceſsful way of producing the early crops, is this: Of the true early frame (or Charlton, if theſe are not to be had) ſow a quantity in boxes or large pots, &c. about the firſt of November, and place them either in a peach-houſe or hot-bed frame, &c., where they may enjoy plenty of air and light, and grow ſlowly; keep them here till the middle of February or firſt of March, and then place them out of doors in a warm and free ſituation; let them be covered with mats at night, and even in the day at firſt, if the weather prove ſtormy, obſerving to harden them by degrees; and when the weather is mild enough, let the mats remain off at night occaſionally; continue this treatment till the firſt of April, and then draw drills three inches deep, on a warm light border in a ſouth aſpect, in which plant them an inch apart, obſerving to take them carefully out of the boxes, &c. that none of them be bruiſed.

Peas, ſown *thickly* in a warm, well-expoſed ſpot, being kept under bell or hand glaſs, and defended from the ſeverity of froſt by mats, &c. through the winter; and being hardened in ſpring, and tranſplanted as above, will alſo ſucceed well, and come in at an early ſeaſon.

For ſucceſſional crops, ſow firſt, of the ſame kind, and on the ſame border, or a ſimilar, about the firſt of January; ſecondly, charltons, and alſo dwarf marrows, on an open ſpot about the firſt of March; thirdly, dwarf or tall marrows, blue Pruſſian, or any of the other kinds, ſo ſoon as the laſt appear above ground, which repeat till the firſt or middle of June; but the laſt ſowing or two, ſhould be of charlton or framing, as theſe anſwer beſt for both early and late crops.

Peas do well on almoſt any kind of garden-ground, but they are moſt prolific in ſtrong ſoils. The land is ſeldom manured for them, as they generally follow ſome crop that required manuring or fallowing.

The beſt method is to ſow in double drills ten inches apart, if they are to be ſticked; as one row of ſticks placed in the middle will generally ſerve both the rows of peas. The diſtance in this caſe is, from four to five feet between the centre of the double lines, according to the ſize of the kinds. For ſingle rows, a foot leſs reſpectively.

Keep clean of weeds, and earth up, firſt, when the plants are about two inches high; ſecondly, when about eight or ten; and laſtly, when they begin to flower.

Late crops of peas are generally much afflicted with the mildew, which retards their growth, and prevents them from *filling*. Perhaps the beſt remedy is, to ſow theſe crops in rich, light, dry loam, and an open, expoſed ſituation.

SECTION XX.

POTATOES

ARE an abundant crop on moſt kinds of garden land, but they are cleaneſt on light loams. In gardening, the ground is ſometimes manured for this crop, and ſometimes not; if ſo, a moderate dunging with any of the kinds beſt adapted to the nature of the ſoil, will generally anſwer.

The object, in gardening, is generally a few early ones, except ſometimes for the ſake of changing crops. For this purpoſe, plant of any of the early kinds on a warm border, or other ſheltered ſpot, in rows eighteen or twenty inches aſunder, and ſix in row, about the firſt of March. Sooner is attended with bad conſequences: the ſeed will ſeldom begin to vegetate before that time, if planted ever ſo ſoon, and if hard froſt or much wet enſue, it will be much injured.

For a principal crop, plant on a free and open expoſure, in rows from twenty to thirty inches aſunder, and from ſix to twelve in row, according to the kinds and quality of the ſoil, any time from the middle of March to the firſt of May. The ſets ſhould generally be buried three inches deep; and they may be put in either with a blunt-ended dibble; or they may be laid in drills; following the former method in light, and the latter in ſtiff, ſoils.

Keep clean of weeds; and when the plants have arrived at the height of three inches, let a little earth be drawn to their ſtems, and when to nine or ten, let them be moulded up for good. Any weeds that appear afterwards, are to be pulled with the hand. The hoe muſt not be uſed after their roots begin to run.

Much has been ſaid reſpecting cutting of Potatoes for ſeed; ſome recommending planting them whole, and others cutting them into ſingle-eyed ſets; ſome cutting them two or three weeks before planting, and others planting as they are cut. My method is this: Cut the large ones into four or five; the middle-ſized into two or three; and the ſmall, plant whole. Plant within forty-eight hours of cutting, and not ſooner than twenty-four: whereby the ſets are of a moderate ſize and ſtrength, nor is there any waſte; are ſufficiently dried to reſiſt corruption, and not too much to prevent inſtant vegetation *.

The method of planting the ſhoots is juſtly exploded. I have, for one, given it fair and frequent trials, and I am convinced it is of little utility.

The *curl* is a diſeaſe, which has given the cultivators of this plant much trouble, nor has there, as yet, perhaps, been any effectual remedy diſcovered †.

It has been ſuppoſed to be occaſioned, either, 1*ſt*, by an inſect being lodged in the eye of the ſet, ſince frequently we find clean and infected ſtems iſſuing from the ſame root, and which continue diſtinctly ſo throughout. 2*dly*, By being planted in too heavy or wet land. 3*dly*, By being planted in too poor and hungry land. 4*th*, By the ſame land having been too frequently and too recently cropped with potatoes. And *laſtly*, as is the moſt general opinion, for want of changing the ſeed.

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* By compariſon, and obſervations made laſt ſeaſon in different parts of the country, I am convinced of the utility of uſing *ſcoops* for taking out the eyes or ſets, in times of ſcarcity; as the remaining part of the root may be uſed for cattle or pigs. The *ſcoop*, however, ſhould be of the deepeſt ſort, that is, rather more than a hemiſphere, whoſe diameter is an inch; for if ſhallower, the ſet will be too weak.

† I have juſt learned, that a reſpectable gentleman in the neighbourhood of Edinburgh, is convinced, by actual experiments made by himſelf, that the cauſe of the *curl*, lies in the ſeed being over ripened; and he adviſes, as a remedy for this diſeaſe, that potatoes, intended for ſeed, ſhould not be planted before the 15th of May; and they ſhould be taken up in a much *greener* ſtate than thoſe intended for culinary purpoſes.

At any rate, it is a malady, which every one ought to endeavour to remedy. What follows are given as hints with that intent, and which, it is hoped, the candid will apply, or improve, as they may ſeem to merit.

In reſpect of the firſt opinion, whether it be really an inſect, or whether it be not rather in conſequence of the ſet being, by ſome unknown cauſe, diſeaſed, merits inveſtigation. That it is an inſect, I cannot bring myſelf to think. But that it may proceed from diſeaſe in the ſet or root, ſeems to carry reaſon along with it. What might occaſion this diſeaſe, may either proceed from the ſeed being injured by froſt, by damp, mould, or being over dried. And it is well underſtood, that, from no diſeaſed ſeed, ſhoots or ſpawn, need we ever expect to raiſe plants as healthy, or that ſhall ever become ſo, as from clean, freſh, and well-matured ſeed, &c.

In reſpect of the ſecond and third opinions, as in fact they embrace the ſame thing, ſince they imply, that neither of the ſituations are congenial to the nature and inclination of the plant in queſtion, I have juſt to ſay, that if a plant ſhall be ſtinted in growth, from any cauſe whatever, diſeaſe will inevitably follow. On annuals of a quick growth, ſuch as the plant in queſtion, this is ſooner perceptible than on others.

In reſpect of the fourth opinion, which certainly carries with it a ſtrong preſumption of the caſe, if we admit there is propriety in changing crops, and that all culinary plants, which are not natives, degenerate leſs or more, if continued in the ſame ſoil ſucceſſively, we may reaſonably ſuppoſe it probably proceeds hence. And yet it hath been proved, in ſome inſtances, that this is not the caſe, by potatoes being continued for many ſucceſſive ſeaſons on the ſame ſpot, without any appearance of the *curl*, although they degenerate in ſize and ſhape.

In reſpect of the laſt and moſt prevalent opinion, viz. for want of changing the ſeed, by which is to be underſtood, from one farm, &c. to another, or from one country or diſtrict to another, much might be ſaid on both ſides of the queſtion. But I muſt beg to ſay, that it by no means carries conviction to me, that this is the cauſe, or indeed, that it can poſſibly operate in the ſmalleſt degree towards it. On the contrary, the *curl* has frequently been brought to places where it was never known before, by this miſtaken notion.

But, may not the ſeed be as effectually changed on the ſame farm, or garden, if of any conſiderable extent, as by being carried from one pariſh or country to another? Are potatoes improvable, like wine, by being ſea-borne, or land-borne, without being afterwards planted in ſoil, different from that in which the laſt grew? Certainly no. And ſhall he who has his ſeed brought from land, non-deſcript, and which he never ſaw, be certain of planting again in that which is eſſentially different in quality? May it not as probably happen, that, *per* chance, he ſhall plant in land exactly ſimilar to that in which his ſeed was produced?

I therefore hold, that he who ſhall be at all due pains in ſaving wholeſome ſeed, by diveſting the crop intended for this purpoſe, of all infected plants, ſo ſoon as they appear; ſecures it from froſt, damp, or much drought, till planted; plants no weak, or inſignificant ſets; plants on freſh, well-broke, moderately-enriched land, of a midling texture, rather light than otherwiſe; allows a ſufficiency of room; and keeps clear of weeds; bids fair for overcoming the anxiety attendant on this malady *.

SECTION XXI.

SALSAFY, SCORZONERA, AND SKIRRET.

THESE are all cultivated alike, and much in manner of Carrot and Parſnip. A free, light, deep ſoil, and an expoſed

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* But the reader may ſee more on this ſubject, in a paper written by myſelf, intituled, "An Inquiry into "the cauſe of Diſeaſes in Plants; with hints for their "Cure or Prevention;" lately publiſhed in Edinburgh.

ſed ſituation, are moſt eligible. The ſeaſon for ſowing is all the month of April; ſowing in drills an inch deep, and twelve or fourteen apart; thinning out to five or ſix aſunder, in line; and keeping clean of weeds.

Theſe roots may alſo be preſerved in Winter, as already hinted.

* * *

SECTION XXII.

SHALLOTS

ARE a precarious crop, being equally ſubject to injury by too much drought or wet. A rich dry loam and free expoſure are moſt eligible. A fixed ſeaſon of planting can hardly be determined, and it is moſt adviſable to perform this operation at different times, viz. November, January, and February.

Plant either in four feet beds at eight inches ſquare, or in rows a foot apart, and four inches in the row.

Keep clean of weeds, and whenever any of the plants begin to canker and become maggoty, pull them up; as otherwiſe the whole will be quickly affected. Neither ſhould the crop remain in the ground after the leaves begin to decay, but ſhould be taken up, gradually dried in an open ſhed, &c. and afterwards ſtored in manner of onions.

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SECTION XXIII.

SPINAGE.

FOR the Summer crops, all ſoils will anſwer; but for the Winter, light rich loam, and a dry ſituation are fitteſt. Manure is ſeldom applied, except for the ſake of what is to follow; yet, by a moderate dunging, the Winter crops are much benefited, and will grow more luxuriantly in Spring.

For the Spring and Summer crops, ſow of the round-ſeeded kind, thinly, in drills a foot apart, from the firſt of February to the firſt of Auguſt, at intervals of ten days each; and for the Winter, of the prickly kind, any time from the middle of July to the middle of Auguſt, alſo in drills as above. Some prefer ſowing broadcaſt; but I believe it is a matter of little importance, provided the plants are kept equally clean, which mode be practiſed. By ſowing in drills, however, the crop is gathered with leſs difficulty, and is much eaſier kept clean. Being of a quick growth, weeding or hoeing is ſeldom neceſſary for the Summer crops. For the Winter, once or twice will generally be ſufficient.

Spinage may ſucceſsfully be tranſplanted; by which method alſo, a ſucceſſion may be had of the ſame ſowing.

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SECTION XXIV.

SEA CALE.

THIS vegetable is moſt ſucceſsfully produced in light rich ſand, of fifteen or eighteen inches in depth. It will do pretty well, however, on all lightiſh loams, that are well mixed with ſharp or drift ſand. In ſtiff ſoils, it makes little progreſs, and is alſo apt to periſh in Winter.

The manner of culture is ſimple; and the plants may either be raiſed from ſeed, or by offsets from the root, which come up in abundance in Spring, and are the eatable part of this vegetable. The moſt eligible method is to ſow or plant (in March or April) in rows, a yard aſunder; and the plants are to ſtand, for good, at the diſtance of ten or twelve inches in the row. As the ſprouts riſe in the Spring, let a little earth be drawn to their ſtems, in order the faſter to blanch them, and render them fit for uſe.

Keep clean of weeds at all times, and in Autumn or Spring let a little compoſt manure, or well-rotten dung, be ſlightly pointed in, ſo as not to injure the roots; at the ſame time ſhedding a little mould on the rows; following much the aſparagus mode of culture.

SECTION XXV.

TURNIPS.

THE lighteſt ſoil in the garden is generally beſt adapted to their culture, and it ſhould alſo be well enriched. If it is to be manured for the turnip crop, compoſt is preferable to ſimples. In either caſe, all the kinds of aſhes, ſoot, and pigeon-dung, are to be avoided. Strong loams, however, if not wet, are abundantly productive of this vegetable, provided they be well broke in the operation of digging, trenching, fallowing, &c.

The firſt of March is ſoon enough to ſow, as we ſeldom ſee plants ſown ſooner come to any good; they generally run to ſeed and canker. A few may be ſown on an early border, but theſe are not much to be depended on; an open ſituation being the beſt at all times of the ſeaſon.

For producing a conſtant ſucceſſion, make it a rule to ſow ſo ſoon as the laſt appears above ground; and repeat this till the firſt of Auguſt. The early white

Dutch is generally ſown for the Summer crops, and the yellow * for Winter, for table and market uſe. They are generally ſown broad-caſt, and thinned out to from nine to fifteen inches apart, according to the quality of the ſoil. In gardening, however, Turnips are alſo frequently ſown in drills, from twelve to twenty-four inches apart, and ſingled out to ſix or eight in line.

In all caſes, the plants ſhould be carefully kept clean from weeds; and in dry weather, the early crops ſhould be frequently refreſhed with water.

The fly is often very troubleſome, but as they only prey for a few days on the infant plants, the moſt effectual way to ſecure a crop is to ſow thick, thereby ſatiating them. Nevertheleſs, they frequently deſtroy them in patches, and ſome

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* It is ſingular, that Yellow Turnip ſhould be ſo little uſed in England. In London, I believe, it is hardly known. Yet it is certainly much ſuperior to the white, both in point of flavour and nutriment; nor is it injurable by froſt in the ſame degree. For cattle feeding, three loads of yellow are equal to four of white; and they are generally a more certain crop, and alſo more productive.

in that caſe, ſow again on the ſame ſpot; but this is ſeldom attended with ſucceſs, as they are either deſtroyed again by the fly, or do not keep pace with the other part of the crop, ſo as to make this an object worth the trouble.

Before concluding this chapter, I would obſerve, that all ſeeds and plants ſhould be committed to the ground as it is turned over, or as ſoon after as conveniency will permit. It is then in the moſt active ſtate, and vegetation inſtantly commences. Neither ſhould ground ever be digged in a very wet ſtate, except, perhaps, ſometimes in fallowing.

CHAPTER V.

CULTURE OF SALLADS AND HERBS.

SECTION I.

SALLADS.

Chervil, Creſs and *Muſtard.*

THESE articles are all raiſed much in the ſame manner; and where there is the conveniency of a few hand-glaſſes, a hot-bed frame, or hot-houſe of any deſcription, with the addition of a few boxes, tubs, or large pots, may be had every day in the year, in abundance, by the trouble of ſowing once a-week, or ten days, as occaſion ſhall require. To ſay more of them, would be trifling with time.

Endive.

Although I have ranked this vegetable as a ſallad, it is alſo frequently uſed in the kitchen; and by many is much in demand.

It ſucceeds beſt on a light, dry, loam. On wet land, it ſeldom fails to rot in autumn. Neither ſhould the ground be manured for this crop at the time of planting.

For the firſt crop, ſow of any of the kinds, preferring the green curled however, in a light open ſpot, about the firſt of June, and plant about the firſt or middle of July, in rows from fifteen to eighteen inches apart, and nine in the row, on an open expoſure. For a full crop, ſow alſo of any of the kinds as above, about the middle of July, and alſo plant as above, about the middle or latter end of Auguſt.

A late crop may be ſown about the middle of Auguſt, and planted out in September, on a light, dry border, in a ſouth aſpect.

Some plant Endive in drills or trenches, and others on the ſurface. In dry ſoils, the former method is adviſable; but in wet ones, the latter mode ſhould be practiſed.

Keep the plants clean of weeds; and let them be earthed up at two or three different times, in order to blanch the leaves. This is alſo effected by tying them up, but in wet ſeaſons they are apt to rot. Endive may be ſucceſsfully preſerved in Winter, by being laid in dry ſand, in the cellar, ſhed, or under a frame and lights, &c. In this latter intention, however, the beſt method is to form the plantations of Endive into beds anſwerable to the ſize of the frames; placing theſe on late in Autumn, on the approach of bad weather; and admitting air freely at other times.

Indian Creſs

Is often uſed in ſallads, and makes a beautiful garniſh. The flowers are the uſeful part for this purpoſe, and the ſeeds make a fine pickle. Any ſoil will anſwer; and the moſt eligible ſituation is againſt a dead fence, or unſightly wall, which it will rapidly cover and beautify.

The ſeaſon for ſowing, is any time from the middle of February to the firſt of June, in drills an inch deep, and in manner of peas, &c.

Lettuce

Is ſucceſsfully cultivated on all ſoils, in all ſituations, and almoſt at all ſeaſons. The times of ſowing are from January to October, at intervals of from one to four weeks, according to the ſeaſon and demand; and of planting, from the firſt of February, to the firſt of November, at intervals alſo as above.

The kinds are numerous; and thoſe moſt to be preferred, are the true green coſs, hardy green, and brown Dutch, for ſtanding the Winter. Theſe are to be planted in October, or beginning of November, at the bottom of a wall or other fence having a ſouth aſpect and dry bottom; or under a frame and lights, hand-glaſſes, border in the peach or vine houſe, &c. &c. in which caſe they are to be duly refreſhed with water, have air freely admitted to them in freſh weather, and to be defended from ſevere froſts, or blanching rains.

Lettuce is frequently forced on hot-beds in the Spring. In this practice it is neceſſary to beware of too much heat; to refreſh duly with water; and to admit large portions of air in freſh weather; for this plant will bear but little artificial warmth with patience.

Parſley

Is both uſed as a ſallad and in the kitchen, and is in conſtant demand. Some force it in hot-beds, &c. but a Winter ſtore is better ſecured by covering with a frame and lights, or hand-glaſſes, part of the preceding Summer's crop; which, for this purpoſe, ſhould be ſown about the firſt of June. Other crops are to be ſown in beds, or rows round the quarters, walks, &c. of the garden, from the firſt of February to this time, as circumſtances ſhall direct; and of the kinds moſt in demand.

The Hamburgh Parſley is an excellent diuretic, and is uſed in ſoups, in the manner of carrot, &c. It ſhould be ſown in March, in drills an inch deep and a foot apart; and when fit, ſhould be thinned out to three or four in line. A few drills may be ſown in July, for Winter and Spring uſe, where a ſucceſſion is required.

Purſlane

May alſo be raiſed in all reſpects, in manner of chervil, creſs, &c. Being of a ſucculent nature, it likes a dry ſand the beſt. It does not ſtand froſt well, and therefore ſhould not be ſown out of doors, ſooner than the firſt of April.

Radiſh

Is plentifully produced on all ſoils, and is ſown from January to September, with ſucceſs, at intervals of from one to three weeks. The ſhort-top and ſalmond are moſt proper for early Spring; the white and red turnip for Summer; and the black Spaniſh for Winter uſe; but theſe three laſt named will ſtand the Winter in general, and for this purpoſe ſhould be ſown on light ſoil, about the firſt of September.

Being ſheltered with a frame and lights, or hand-glaſſes, would be of advantage for the white and red turnip kinds; in which caſe, air muſt be freely admitted in freſh weather, and water moderately applied.

In the latter end of Spring, the ſhort-top, and ſalmond kinds frequently get ſticky, and run for ſeed ſooner than ſucceſſional crops can be got forward, in ſultry weather. To remedy this inconveniency in a great meaſure, it may be gratifying to the admirers of this ſallad to know, that by cloſely pinching off the tops, drawing them upwards half an inch, ſo that the tap-fibres be juſt broke, and letting them remain till wanted, they will keep freſh and good above a week afterwards, until the ſucceſſional crops come forward.

In forcing of this ſallad on dung-heat, what is ſaid above reſpecting lettuce, will apply.

SECTION II.

POT HERBS.

Baſil.

THIS is a tender exotic, and requires artificial heat to forward it in Spring. About the firſt of March, ſow, either on a gentle dung-heat, in a vine or peach houſe, or as hinted in page 19, in rich, light mould; and tranſplant, when fit, on a well-expoſed, rich, light ſpot of ground, in rows a foot aſunder, and three inches in the row.

Of this plant there are two ſorts, the *tall* and the *buſh*; and they are both uſed in the ſame intention. For ſoups, &c. they are much in demand, on account of their high flavour.

Such part as is to be kept for winter uſe, ſhould be cut over, ſo ſoon as full in flower, and gradually dried in an open ſhed, &c.

Borage.

This is both uſed as a pot-herb, and *for cool tankards*. It ſhould be ſown in a light, dry ſpot, in March, April, May, and June. Wherever it has been ſown laſt year, will, if let ſtand till of maturity, be ſhown this; nor is it eaſy to clear the ſoil of it, as its ſeeds lie long in the earth, keep freſh, and ſo ſpring again.

Fennel

May either be raiſed from ſeed, or may be propagated by ſlips of the root. It will grow freely, in any ſoil that is not very ſtiff.—A few plants of it will ſerve a large family.

Marigold

Is to be ſown in the ſpring months, in two or three ſucceſſions, from the middle of February, to the firſt of May. The flowers *only* are uſeful.

Marjoram, Savory and *Thyme.*

The ſame culture anſwers all. Sow in beds of light earth, in a free ſituation, about the middle of March, or firſt of April. When the plants are a few inches high, thin them out to ſix apart each way; or tranſplant into rows nine or ten inches aſunder, and three in line. If the knotted marjoram, or ſweet ſavory are wanted early, a little may be raiſed in manner of the Baſil as above.

Green Thyme, pot Marjoram, and Winter Savory, may be kept freſh all winter, if required, by being ſheltered with hand-glaſſes, a frame and lights, &c. but when properly dried, they have the ſame effect in ſoup, broth, &c. and this is ſeldom practiſed. Theſe laſt are moſt generally propagated by ſlips, planted in April, July, or Auguſt, in light, rich earth, at ſix inches apart.

Mint,

That is, ſweet, or ſpear mint, is propagated moſt ſpeedily by ſlips of the root. The ſeaſon is March or April. It may either be planted in rows, nine or ten inches aſunder, or on four foot beds. Rich, light loam will produce it in higheſt perfection.

If it is wanted early, a little forced on a ſlight dung-heat in manner of aſparagus, either under a frame and lights, or hand-glaſſes, will generally ſerve till it comes in the natural ground.

Sage.

This plant is propagated, either by ſlips of the root, or by cuttings, with facility.

For the former method, March or September is the ſeaſon. For the latter, any time from May to Auguſt. Sage thrives, and alſo ſtands the Winter beſt in lightiſh, ſandy loam, and a free expoſure. Its leaves for Winter uſe, are to be cut when full in flower, and gradually dried in a ſhed, &c.

Sorrel

Will grow almoſt any where, nor is it eaſily eradicated from the ſoil afterwards. Slips planted in March, or indeed any time, will not fail to grow vigorouſly. The French and the common ſorts are both propagated alike.

Tanſy and Tarragon.

What has been ſaid above will apply here, except that Tarragon will ſometimes, if in a wet ſituation, periſh in Winter.

CHAPTER VI.

ON THE ROTATION OF CROPS.

AS in agriculture, ſo in gardening, a proper rotation of crops is of great importance, and the reaſonable and uſeful practice of cropping a *part* of their ground *every ſeaſon*, with ſome of the ſpecies of grain or graſſes, is becoming prevalent among market gardeners; which, beſides being uſeful for their cattle, is found of infinite advantage to their ground.

This matter, however, can by no means be ſo effectually accompliſhed in the garden, as in the farm, for theſe reaſons: it is ſmaller, and the articles to be cultivated are more numerous, and alſo more a-kin to one another.

The different articles, however, might with propriety be claſſed in this caſe, as, Brocoli, Cabbage, Cauliflower, and Savoys; Beans, French-beans, and Peas; Carrot, Beet, Parſnip, and Turnip; Leeks, Onions, Shallots, &c. Celery, Endive, and Lettuce, &c. &c.

Celery is an excellent preparative for aſparagus, onions, or cauliflower; turnip, or potatoes, for cabbage or greens; brocoli or cabbage, for beans or peas; cauliflower, for onions, leeks, or turnip; aſparagus land that has lain long, for carrot or potatoes; (currant, gooſeberry, raſpberry, and ſtrawberry land, may anſwer the ſame purpoſe); turnip, for celery or endive; peas, &c. for clover, as a reſtorative, with which barley or oats might be ſown.

In this latter caſe, however, the two preceding crops ſhould not be manured, as otherwiſe, at leaſt in moſt inſtances, the barley, &c. would be apt to grow rank, to the detriment of the clover.

After the land has lain one or two ſeaſons thus, it will again be fit for the reception of an eſculent crop, of any kind, as carrot, aſparagus, potatoes, &c.

Clover, with barley or oats, may alſo very properly be laid down as a reſtorative for land of any kind, which has been long under eſculent crops without a proper *change*, and is conſequently foul and cankering.

If it is ſuffered to lie two ſeaſons, the land will again be prepared for culinary vegetables of any kind.

As a change for land as above, and which cannot be ſpared from eſculent crops above one ſeaſon, a crop of barley, oats, rye, or wheat, as a *cleanſer*, may be advantageouſly taken; which will, in a great meaſure, refreſh, reſtore, and again render it fit for the production of wholeſome kitchen vegetables.

In all caſes, a ſtudied rotation is to be adviſed, and ſuch an one as that no crop of the ſame claſs may immediately follow another. For the more effectual accompliſhment of which, the garden ſhould be regularly divided into quarters, numbered, and a journal kept, wherein is recorded what reſpects the cropping, manuring, trenching or fallowing of each of them.—Thus:—

No. 1. (1793.) Subtrenched after aſparagus, for carrot, without manure. Winter fallowed. (1794.) Early cauliflower, with a moderate dunging, 2d Mar. Yellow turnip, with a compoſt dreſſing, 20th July. (1795.)

(1795.) Onions, without manure, 8th Feb. Cabbage, with a light dunging, 5th Oct. (1796.) Charlton peas, for a late crop, without manure, 10th June; trenched three ſpit deep, in Dec. Winter fallowed. (1797.) Potatoes, with a moderate dunging, 20th Mar. German greens, without manure, 10th Sept.: intended for leeks next June.

This ſketch is taken from my Journal formerly kept, and is here given as an example *only*; which every judicious gardener is requeſted to alter or improve, as he may find convenient.

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PLATE. I.

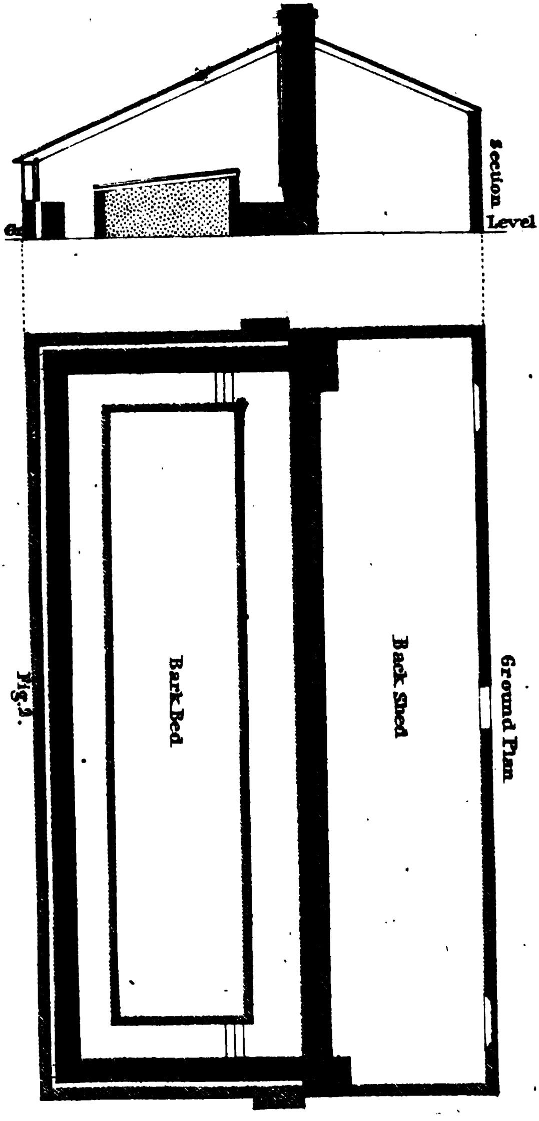


Fig. 2.

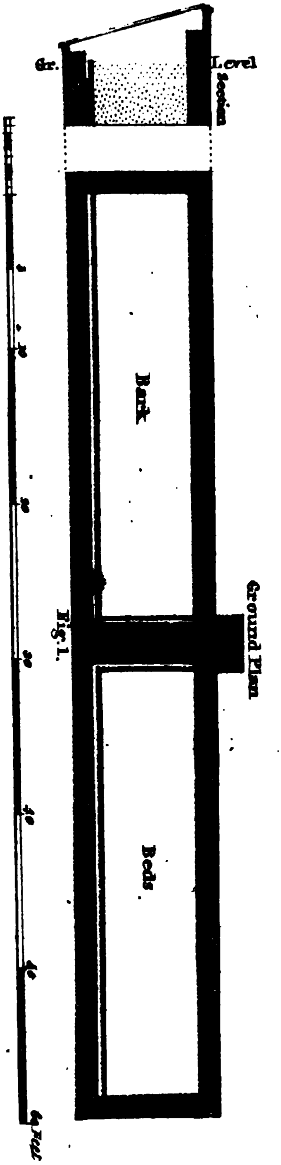


Fig. 1.

W. Nicol, Del.

D. Lizars, sculp.

PLATE. II.

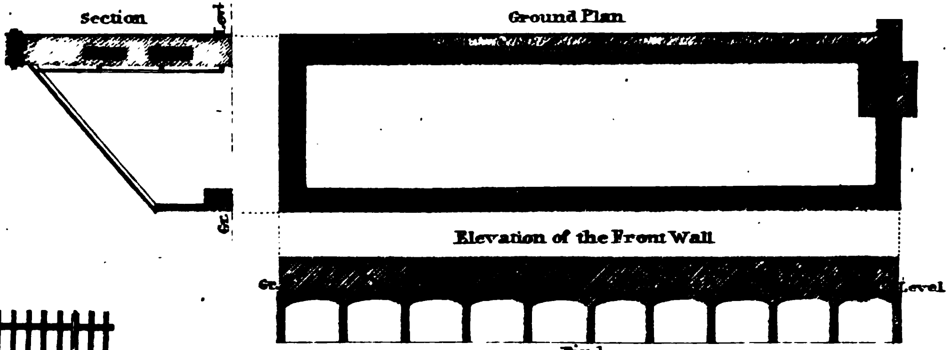


Fig. 1.

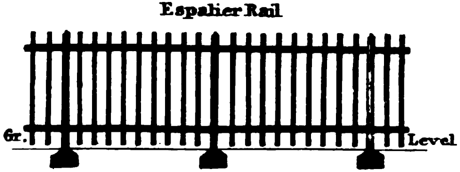


Fig. 3.

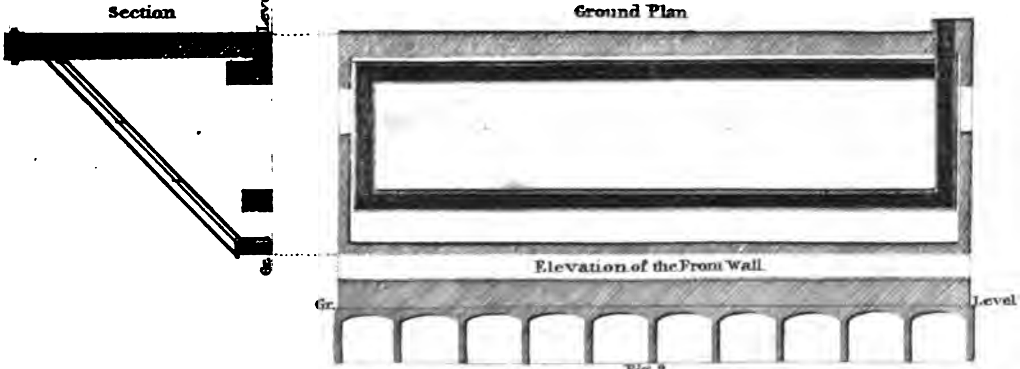
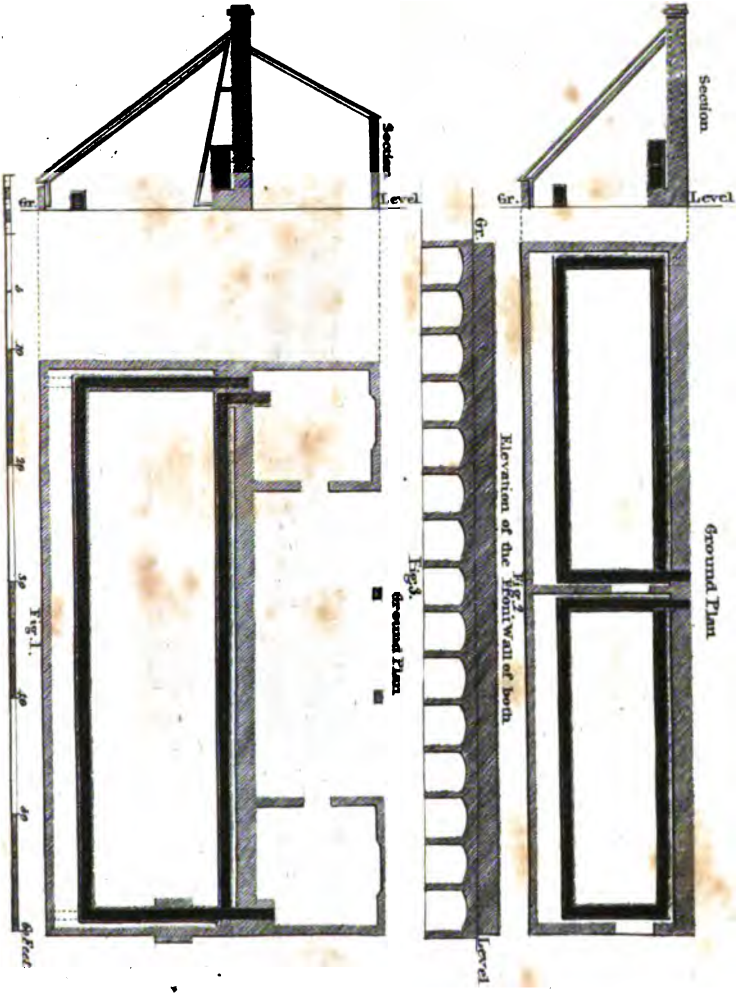


Fig. 2.

W. Vical, Del.

H. Linarn, ſculpt

PLATE III.



W. Nicol, Delt

D. Lizars, Sculpt

PLATE . IV.

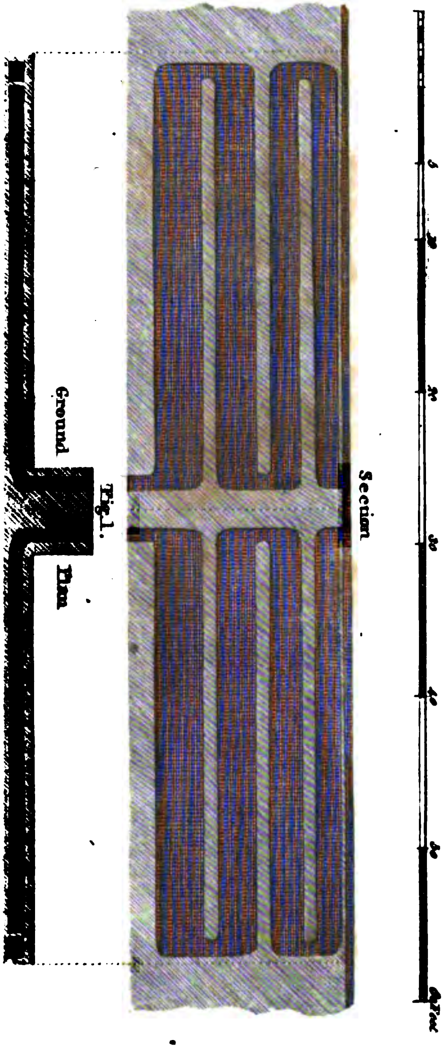


Fig. 1.

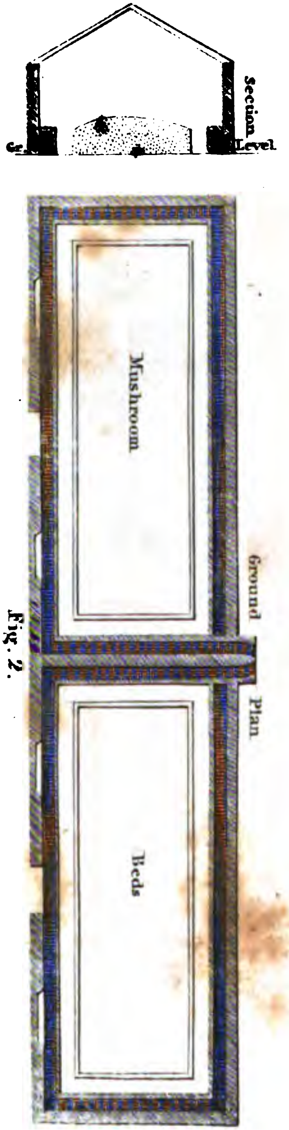


Fig. 2.

W. Nicol Del.

W.H.Lizars Sculpt

PLATE V.

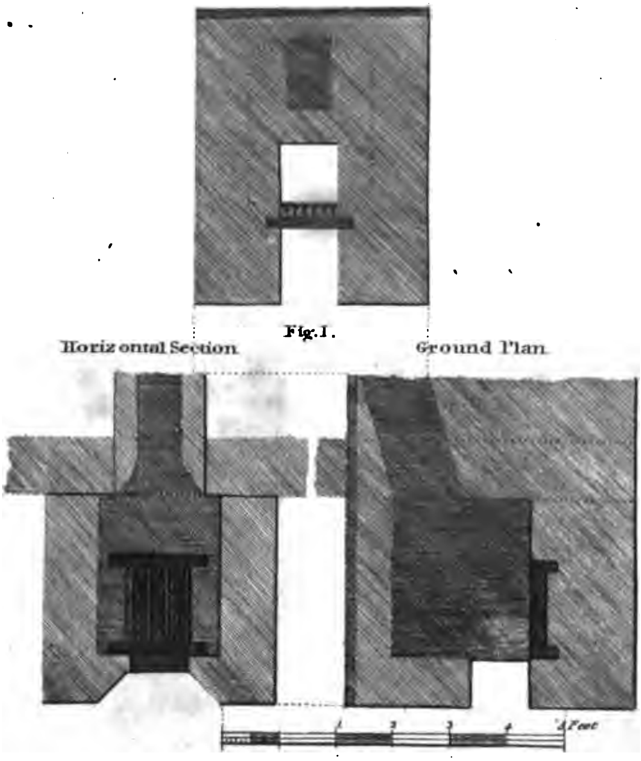


Fig. 1.

Winter Pruning

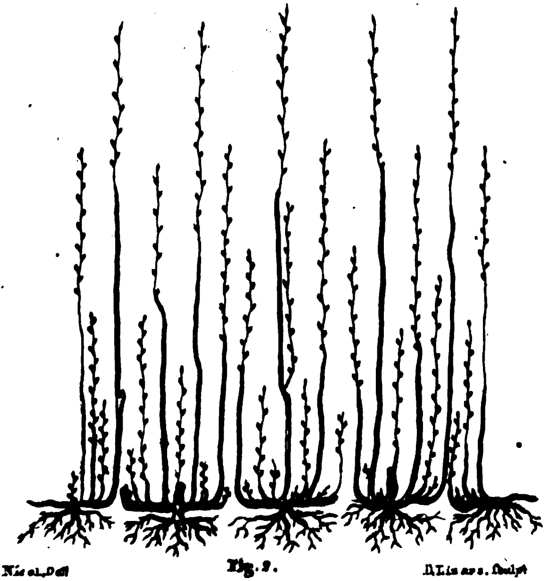
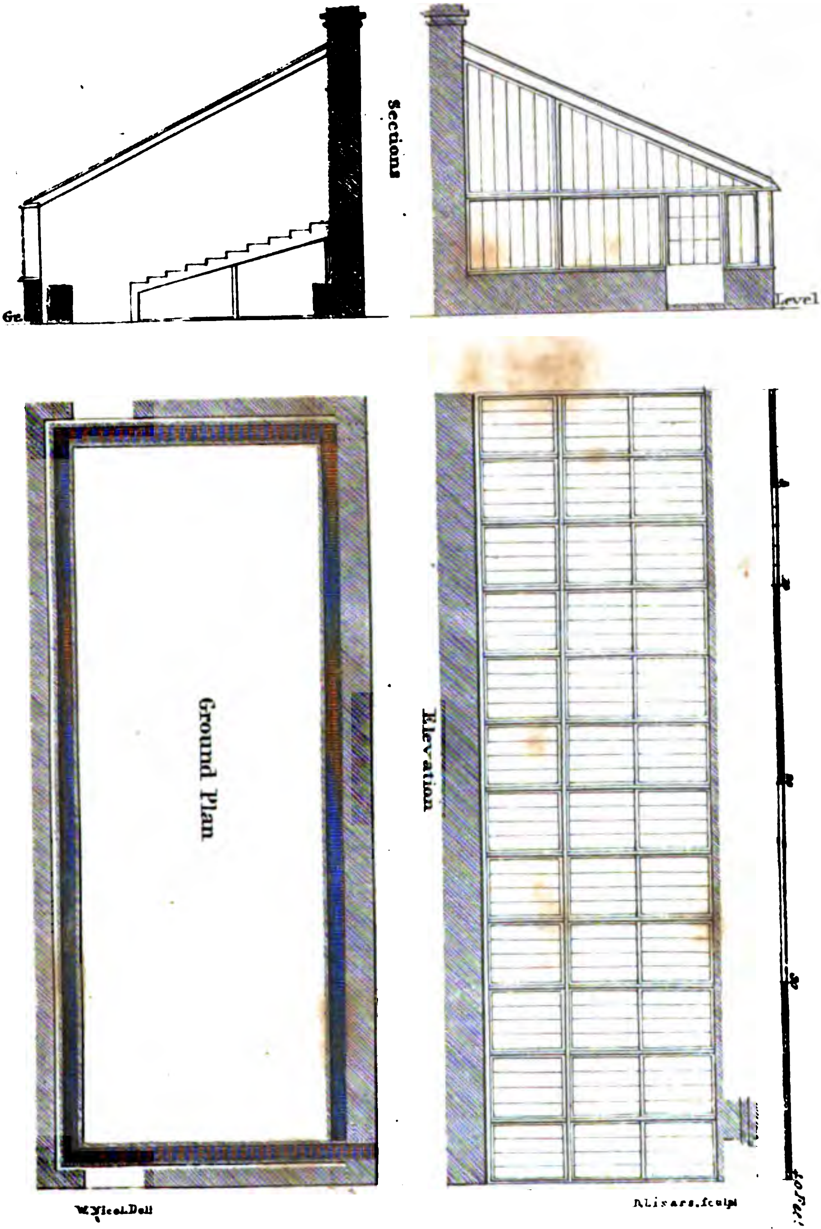


Fig. 2.

W. Nicol, Del.

D. Lizars, Sculpt.

PLATE. VI.



W. Nicol. Del.

R. Lizars. Sculpt

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